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OF

AGRICULTURAL

FIELD

EXPERIMENTS

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**PUNJAB, HIMACHAL PRADESH
AND
JAMMU & KASHMIR**

1948-53



सत्यमेव जयते

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FOREWORD

It is a well recognized fact that the level of agricultural production in India is one of the lowest in the world and it is only by the exploitation of scientific methods of agriculture that we can hope to increase our agricultural production to the level necessary for providing a reasonable standard of living to the country's population. Properly planned and conducted field experiments provide a reliable basis for propagating improved agricultural techniques among farmers. A number of research institutes and other experimental centres are functioning under the Central Ministry of Agriculture, the Commodity Committees and the State Governments, in which research on agricultural problems is going on. The need for an integrated account of the researches done in these organisations and institutions in the country has been felt for a long time, particularly in the context of planning. The absence of such a unified account has often led to duplication of work and delay in the utilisation of the results for practical farming. The Institute of Agricultural Research Statistics of the Indian Council of Agricultural Research has, therefore, rendered a most timely service by preparing a compendium of all agricultural field experiments conducted in India upto 1953 and similar compendia are under preparation by the Institute for subsequent years.

The present compendium contains critical summaries of results of experiments bearing on important agronomic factors such as the responses of crops to fertilizers and manures, inter-relationship of fertilizers, varieties and cultivation practices and other information of value for giving sound advice to farmers in different regions. I am sure that these results will be fully utilised by agricultural institutions, research workers, planners and extension organisations. The chief merit of the present publication is that it brings together in one place the results of experimentation carried out under diverse soil, climatic and agricultural conditions obtaining in India. Workers in one State can thus supplement data for their own area by results from other regions where conditions may be similar and thereby re-inforce their own conclusions. For the same reason I hope that this publication will be of use to workers in other countries also.

A Standing Committee consisting of the Agricultural Commissioner with the Government of India, the Director, Indian Agricultural Research Institute and the Statistical Adviser, Indian Council of Agricultural Research, has been set up to provide general guidance to the work under this scheme. I congratulate the members of this Committee and in particular the Statistical Adviser and his associates at the Institute of Agricultural Research Statistics for bringing out this compendium. The preparation of this compendium has been made possible only by the whole hearted co-operation of the States and other organisations in making available the results of their experimental researches for this purpose. My thanks are due to the officers of the State Departments of Agriculture and other institutions for participating in this work. I hope that the present series will be followed by periodical publication of similar compendia for later years, in order that the availability, in a consolidated form, of results of scientific experiments in agriculture in India may be maintained up-to-date.

NEW DELHI,
August 20, 1962.

A.D. PANDIT
Vice-President,
Indian Council of Agricultural Research.

PREFACE

A large number of agricultural field experiments on different problems is being conducted in the country by Central and State Governments, Research Institutes, Commodity Committees and other organisations engaged in agricultural research. In addition, a number of schemes involving field experimentation is sponsored by the Indian Council of Agricultural Research in different States. The absence of a unified record of the results of these various experiments has considerably handicapped planning of further research and development and has often led to duplication of efforts.

Vaidyanathan brought out in 1933 a useful catalogue of manurial experiments conducted in India till then. Considering that Vaidyanathan's work was confined to manurial experiments and the fact that an enormous increase has taken place in the number and scope of agronomic experiments in recent years in India, the Indian Council of Agricultural Research launched the scheme of National Index of Field Experiments in 1954. The object of the scheme was two-fold :

(i) the preparation of compendium of all the field experiments for the period 1935-53 and

(ii) the preparation of index cards for individual experiments from 1954 onwards.

Under the scheme, results of all agricultural field experiments other than purely varietal trials were to be consolidated. Subsequently at the time of the extension of the scheme in 1959 it was decided that the compendium would be prepared in the first instance for the period 1948-53 and a similar compendium would be prepared for the period 1954-59. The present series for the period 1948-53 has been prepared in pursuance of this decision.

The compendium is divided into 15 volumes one each for (1) Andhra Pradesh (2) Assam, Manipur and Tripura (3) Bihar (4) Gujarat (5) Kerala (6) Madhya Pradesh (7) Madras (8) Maharashtra (9) Mysore (10) Orissa (11) Punjab, Jammu & Kashmir and Himachal Pradesh (12) Rajasthan (13) Uttar Pradesh (14) West Bengal and (15) all Central Institutes. In each volume back-ground information of the respective State regarding its physical features, soils, rainfall and climate, agricultural production and area under different crops is given. A map showing different regions of the State, soils and agricultural research farms is also included. The experiments reported in each volume have been arranged cropwise for each State. All the experiments belonging to a particular crop at various research stations are grouped together. For a particular crop, experiments are arranged according to the following classification :

Manurial (M), Cultural (C), Irrigational (I), Diseases, Pests and Chemicals other than fertilisers (D), Rotational (R), Mixed Cropping (X) and combinations of these wherever they occur (e.g., CM as Cultural-cum-Manurial). Experiments in which crop varieties also form a factor are denoted by adding V to their symbol and are given together (e.g., MV as Manurial-cum-Varietal). The results of an experiment are given along with other basic information such as rotation of crops followed, cultural practices adopted, etc.

For making maximum use of the experimental data all the important tables giving the average yields of various treatments along with the appropriate standard errors have been presented. No attempt has, however, been made to summarise the data of groups of experiments on any particular item and to draw any general conclusions. This will be done for the period 1948-59 while publishing the compendium for the period 1954-59.

This publication is the result of the co-operative endeavour of a large number of persons both at the Centre and in the States. I should particularly mention in this connection, guidance and help rendered in the formulation of the scheme by Dr. D.J. Finney F.R.S. of Aberdeen University, Scotland, during his stay at the Institute of Agricultural Research Statistics as an F.A.O. Statistical Expert in 1952-53.

(ii)

At the Institute of Agricultural Research Statistics, the work under the scheme was carried out under the supervision and guidance of Shri T.P. Abraham, Assistant Statistical Adviser. Shri G.A. Kulkarni, Statistician, looked after the detailed working of the scheme. These officers have been largely responsible for the preparation of the manuscript of the compendium and it is a pleasure to thank them for the hard work they have put in for getting this compendium ready. Messrs O.P. Kathuria, B.V. Srikantiah, M.L. Sahni, B.P. Dyundi, S.D. Bal and P.K. Jain of the statistical staff of the Institute deserve special mention for their careful scrutiny of the data and preparation of the material for the compendium. Thanks are also due to Dr. Uttam Chand, Professor of Statistics, now with the Central Statistical Organisation, Shri K.S. Avadhany, Assistant Statistician, also now with the Central Statistical Organisation, and Shri K.C. Raut, Statistician in this office who were associated with the scheme in its initial stages.

The burden of collecting data from original records by visiting different research stations and the analysis of a large number of experiments, only the primary data for which had been recorded in the files, fell on the regional staff appointed by the Indian Council of Agricultural Research in different States. They deserve to be congratulated for the patient work they have put in. The State Departments of Agriculture, Central Institutes and Commodity Committees made data for the experiments conducted within their jurisdiction readily available. The Indian Council of Agricultural Research acknowledges this willing co-operation without which the consolidation of the results would not have been possible. Various State officers who helped the project by making the data accessible to the statistical staff of the project and worked as the regional supervisors for the scheme also deserve thanks by the Council for their active help. The list of names of the regional supervisors is given on the following page.

NEW DELHI,
August 16, 1962.

V.G. PANSE
Statistical Adviser
Institute of Agricultural Research Statistics
(I.C.A.R.)

**REGIONAL SUPERVISORS FOR THE NATIONAL INDEX
OF FIELD EXPERIMENTS**

Region and headquarters	Regional Supervisors :
1. ANDHRA PRADESH (HYDERABAD)	SHRI D.V.G. KRISHNAMOORTHY, Deputy Director of Food Production, Andhra Pradesh. SHRI JAGANNATH RAO, Joint Director of Agriculture (Research), Andhra Pradesh. DR. KHADRUDDIN KHAN, Joint Director of Agriculture (Research), Andhra Pradesh. DR. WAHIUDDIN, Headquarters Deputy Director of Agriculture (Research), Andhra Pradesh.
2. ASSAM, MANIPUR AND TRIPURA (SHILLONG)	SHRI L.K. HANDIQUE, Director of Agriculture, Assam. SHRI S. MAJID, Director of Agriculture, Assam. DR. S.R. BAROOHA, Director of Agriculture, Assam.
3. BIHAR (SABOUR)	DR. R. RICHARIA, Principal, Agriculture College, Sabour. SHRI R.S. ROY, Principal, Agriculture College, Sabour.
4. KERALA (TRIVANDRUM)	SHRI N. SHANKARA MENON, Director of Agriculture, Kerala. SHRI P.D. NAIR, Director of Agriculture, Kerala.
5. MADHYA PRADESH (GWALIOR)	DR. T.R. MEHTA, Principal, Agriculture College, Gwalior.
6. MADRAS (COIMBATORE)	SHRI C.R. SHESHADRI, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. SHRI P.A. VENKATESWARAN, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. LATE SHRI M. BHAVANI SANKARA RAO, Vice-Principal & Secretary, Research Council, Agriculture College, Coimbatore. SHRI T. NATARAJAN, Agronomist & Secretary, Research Council, Agriculture College, Coimbatore. SHRI A.H. SARMA, Extension Specialist & Secretary, Research Council, Agriculture College, Coimbatore.
7. MAHARASHTRA & GJUARAT (FORMER BOMBAY STATE) (POONA)	SHRI D.S. RANGA RAO, Statistician, Department of Agriculture, Poona.

Owing to transfers and other changes more than one Regional Supervisor have been shown against several states as these officers have acted as Regional Supervisors during different periods from 1955 to 1962.

(iv)

8. MYSORE
(BANGALORE) SHRI A. ANANT PADMANABHA RAU,
State Statistician, Mysore State.
 9. ORISSA
(BHUBANESHWAR) DR. U.N. MOHANTY,
Dy. Director of Agriculture (H.Q.), Orissa.
 10. PUNJAB, JAMMU &
KASHMIR AND HIMACHAL
PRADESH (CHANDIGARH) SHRI P.S. SAHOTA,
Statistician, Department of Agriculture, Punjab.
 11. RAJASTHAN
(JAIPUR) SHRI H.C. KOTHARI,
Statistician, Department of Agriculture, Rajasthan.
 12. UTTAR PRADESH
(LUCKNOW) DR. K. KISHEN,
Chief Statistician to Govt. of U.P.
Department of Agriculture, U.P.
 13. WEST BENGAL
(CALCUTTA) SHRI S.N. MUKHERJEE,
Statistical Officer,
Directorate of Agriculture,
West Bengal.
DR. S. BASU,
Statistical Officer,
Directorate of Agriculture,
West Bengal.
-

**ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND
PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS'
FIELDS**

Crop :- In the top left coner is given the name of the crop on which the experiment is conducted. Within brackets along side the crop is mentioned the season wherever the information is available.

Ref :- Against the sub-title 'reference' is mentioned the name of the State, the year in which the experiment is conducted and the serial number of the experiment for that year given in brackets.

Abbreviations adopted for States are as follows :-

A.P.	Andhra Pradesh	Mn.	Manipur
As.	Assam	Mh.	Maharashtra
Bh.	Bihar	Ms.	Mysore
Dl.	Delhi	M.P.	Madhya Pradesh
Gj.	Gujarat	Or.	Orissa
H.P.	Himachal Pradesh	Pb.	Punjab
J.K.	Jammu & Kashmir	Rj.	Rajasthan
K.	Kerala	Tr.	Tripura
M.	Madras	U.P.	Uttar Pradesh
		W.B.	West Bengal

Repetition of the experiment in other years is indicated in the same line against 'reference' by stating the year and serial number for each repetition side by side *e.g.* U.P. 53(19)/52(42)/51(20) etc.

Site :- Name of the Research Station is mentioned along with the place where it is located, *e.g.* Agri. Res. Stn. for Agricultural Research Station.

For Central Institutes, the corresponding standard abbreviations have been adopted *e.g.* I.A.R.I. for Indian Agricultural Research Institute.

Type :- Abbreviations used against this item are one or more than one of the following :-

C—Cultural ; D—Control of Diseases and Pests ; I—Irrigational ; M—Manurial ; R—Rotational ; V—Varietal and X—Mixed cropping. *e.g.* CM. is to be read as Cultural-cum-Manurial.

Results :- Information under this heading should be read against the following items :-

(i) General mean. (ii) S.E. per plot. (iii) Result of test of significance. (iv) Summary table (s) with S.E. of comparison (s).

Abbreviations used in the text of the experiments :-

ac.—acre.	C.L.—Cart load.
Ammo. Phos.—Ammonium Phosphate.	C.M.—Cattle Manure.
A/N—Ammonium Nitrate.	C/N—Chilean Nitrate.
A/S—Ammonium Sulphate.	C/S—Copper Sulphate.
B.D.—Basal Dressing.	F.M.—Fish Meal or Fish Manure.
B.M.—Bone Meal.	F.W.C.—Farm Waste Compost.

F.Y.M.—Farm Yard Manure.	N.—Nitrogen.
G.M.—Green Manure.	Nitro phos—Nitro phosphate.
G.N.C.—Groundnut cake.	P.—Phosphate.
K —Potash.	Pot. Sul.—Potassium Sulphate.
lb.—Pounds.	Super—Super Phosphate.
M.C.—Municipal Compost.	T.C.—Town compost.
Mur. Pot.—Muriate of Potash.	Zn. Sul.—Zinc Sulphate.

BASAL CONDITIONS

Information under the above heading to be read against the following items :

A. For annual crops :

(i) (a) Crop rotation if any. (b) Previous crop. (c) Manuring of previous crops. (State amount and kind). (ii) (a) Soil type. (b) Soil analysis. (iii) Date of sowing/planting. (iv) Cultural practices. (a) Preparatory cultivation. (b) Method of sowing/planting. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring with time and method of application. (vi) Variety. (vii) Irrigated or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season (State name of the season along with the month). (x) Date of harvest.

B. For perennial crops :

(i) History of site including manuring and other operations. (ii) (a) Soil type. (b) Soil analysis. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing/planting. (vi) Age of seedling at the time of planting. (vii) Basal dressing with time and method of application. (viii) Cultural operations during the year. (ix) Inter cropping if any. (x) Irrigated or Unirrigated. (xi) Rainfall during crop season. (xii) Date of harvest.

C. For experiments on cultivators' fields :

(i) (a) Crop rotation, if any. (b) Previous crop. (c) Manuring of previous crop. (ii) Soil type in general. (iii) Basal manuring with time and method of application. (iv) Variety. (v) Cultural practices. (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedings per hole. (vi) Period of sowing/planting per hold. (vii) Irrigated or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season. (x) Period of harvesting.

DESIGN

Information under this heading to be read against the following items :

A. For annual crops :

(i) Abbreviations for designs : C.R.D.—Completely Randomised Design. R.B.D.—Randomised Block Design ; L. Sq.—Latin Square ; Confd.—Confounded ; Fact.—Factorial. (other designs and modifications of the above to be indicated in full). (ii) (a) No. of plots per block. (b) Block dimensions (iii) No. of replications. (iv) Plot size. (a) Gross. (b) Net. (v) Border or guard rows kept. (vi) Whether treatments are randomised (separately in each block).

B. For perennial crops :

(i) Abbreviations for designs : C.R.D.—Completely Randomised Design ; R.B.D.—Randomised Block Design ; L. Sq.—Latin Square ; Confd.—Confounded. (other designs and modifications of the above indicated in full). (ii) (a) No of plots per block. (b) Block dimensions. (iii) No. of replications. (iv) No. of trees/plot. (v) Border or guard rows kept. (vi) Are treatments randomised.

C. For experiments on cultivators' fields :

(i) Method of selection of experimental sites. (ii) No. and distribution of experiments. (iii) Plot size. (a) Gross. (b) Net. (iv) Whether treatments are randomised.

(vii)

GENERAL

Information under this heading to be read against the following items :—

A. For annual crops :

(i) Crop conditions during growth with date of lodging, if any. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken (iv) In case of repetition in successive years—(a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places, (a) names of the places along with reference. (b) reference to combined analysis, if any. (vi) Abnormal occurrences like heavy rains, frost, storm etc., if any. (vii) Any other important information.

B. For perennial crops :

(i) Crop condition during the year. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years—(a) from what year to what year, (b) reference to combined analysis, if any. (v) Abnormal occurrences like heavy rains, frost, storm etc , if any. (vi) Any other important information.

C. For experiments on cultivators' fields :

(i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years, (a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.

GLOSSARY OF VERNACULAR NAMES OF CROPS

Sl. No.	Name of Crop	Botanical name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi & Kashmiri
1.	Paddy	<i>Oryza sativa L.</i>	Dhan	Dhan	Dhano	Vadlu, Biyyam Godumalu	Nel	Nellu	Bhatta	Bhat	Dangar	Dhan ; Chawal	Chaul ; Dhan
2.	Wheat	<i>Triticum Sativum Lamk ; Triticum aestivum L.</i>	Gaum ; Ghehu	Gam	Gabam		Kothumai	Gothambu	Godhi	Gahu	Ghahu	Gehon	Kanak
3.	Barley	<i>Hordeum vulgare L.</i>	Ja'dhan	Joba	Jaba, Barihi	Barley	Baarli arisi	Barley	Barley akki	Satu ; Jav	Jav	Jau	Jaun
4.	Bajra	<i>Pennisetum typhoides stapf Ex Hubbard</i>	—	Bajra	Bajra	Sajja	Kambu	Kambu	Sajje	Bajri	Bajri	Bajra	Bajra
5.	Jowar	<i>Andropogon sarghum Brot ; Sorghum vulgare Pers.</i>	—	Jowar	Juara	Jonna	Cholam	Cholam	Jola	Jowari ; Jondhla	Jowari ; Juar	Jowar ; Jaur	Jowar
6.	Maize	<i>Zea mays L.</i>	Gom-dhan	Bhutta	Macca	Mokka-jonna	Makka cholam	Cholam	Musukina jola	Makka	Makkai	Makka	Makki ; Makayco
7.	Soybean	<i>Glycine hspida ; Glycine maxe Merr.</i>	Garo mah	Gari kalai	—	Soyabin Chikkudu	Soya payaru	Soybean	Soyabean	Soybin	Soyabin	—	Soyabean
8.	Gram	<i>*Cicer arietinum L.</i>	Butmah	Chola	Boot	Sanagalu	Kadalai ; Sundal	Kadala	Kadale	Harbara	Chana	Chana	Chhole ; Chana
9.	Mash (Black gram)	<i>Phaseolus mungo var. radiatus Linn</i>	Matimah	Mashkalai	Biri	Mioumulu	Uzhuudu	Uzhuudu	Uddu	Udid	Adid ; Udad	Urd	Mash ; Urd
10.	Cowpeas	<i>Vigna catieng Walp ; Vigna sinensis Savi.</i>	—	Barbati	—	—	Thatapayaru	Mambayar	Alasande	Chavli	Chola ; Choli	—	Lobia ; Kara.
11.	Potato	<i>Solanum tuberosum L.</i>	Alooguti	Alu	Bilati Alu	Bangladumpa	Uruzhai kilangu	Urala kizangu	Alu gedde	Batata	Aloo, Batata	Aaicoo	Alu
12.	Sweet Potato	<i>Ipomoea batatas Lam.</i>	Mitha Aloo	Mishti Alu	Kanda-mula	Chilagadadumpa	Seeni kilangu	Cheeni kizangu	Genasu	Ratalu	Shakaria	Shakar-kandi	Shakarkandi
13.	Colocasia	<i>Colocasia antiquorum Schott.</i>	—	Kachu	Saru	Chemadumpalu	Sambu Sapan ; Kizhangu	Chembu	Kesavina gedde	Alu	Alvi	Akhi Dhueya	Arvi
14.	Sugarcane	<i>Saccharum officinarum L.</i>	Kuhiar	Akh	—	Cheruku	Karumbu	Karumbu	Kabbu	Oos	Sherdi	Ganna ; Kamad ; Naishakar	Kamad ; Ganna ; Eakh
15.	Cotton	<i>Gossypium spp.</i>	Kapah	Karpas ; Tula	Kapa	Pratti	Paruthi	Paruthi	Hatti	Kapus	Kapas	Kapas	Kapah
16.	Tobacco	<i>Nicotiana tabacum L.</i>	Dhopat	Tamak	Uanpatra	Pogaku	Pugayilai	Pukayila	Hoge soppa	Tambaku	Tamaku	Tambaku	Tamaku ; Tambaku
17.	Groundnut	<i>Arachis hypogaea L.</i>	China Badam	Cheena badam	China badam	Nelash-anga	Nilkadalai	Nilakkadla	Kadale kayi	Bhui-mug	Magafali	Mung-phali	Mungfalt

GLOSSARY OF VERNACULAR NAMES OF CROPS (Contd.)

Sl. No.	Name of Crop	Botanical name	Assamese	Bengali	Oriya	Telugu	Tamil	Malayalam	Kannada	Marathi	Gujarati	Hindi	Punjabi & Kashmiri
18.	Brown Sarson	<i>Brassica campestris</i> var. <i>dichotoma</i>	Sariah	Sarisha	--	Ava	Kadugu	—	Sarshapa	Shiras	Sarsav	Sarsoon	Brown saronh
19.	Raya (Mustard)	<i>Brassica juncea</i> Coss.	Sariah	Rai Sarisha	Rai	Avalu	Kadugu	Kaduku	Kempu sasive	Mobri	Rai	Rai	Rai
20.	Toria (Indian rape)	<i>Brassica campestris</i> var. <i>toria</i> Duthie	Sariah	Tori sarisha	—	Ava	Kadugu	—	—	Saras	Sarsav	Toria	Toria
21.	Linseed	<i>Linum usitatissimum</i> L.	Tisi	Tishi	Peshi	Avise	Alivithai	Cherucha navithu	Agase	Javas ; Alsi	Alsi	Alsi	Alsi
22.	Berseem	<i>Trifolium alexandrinum</i> L.	—	Berseem	Gini ghasa	—	—	—	—	Bersim gavath	Barsim	Berseem	Berseem
23.	Lucerne	<i>Medicago sativa</i> L.	Lucerne ghah	Lusern	Lusarna	Garam Masal	Kuthirai-masal	Lucerne	<i>Kudure masale</i>	Lasun ghas ; Vilaiti ghavat	Gadab Rajko	—	<i>Lucsn</i>
24.	Sudan grass	<i>Sorghum sudanense</i> stapf.	—	—	Sudan ghasa	Sudan gaddi	—	—	Sudan hullu	—	—	Sudan ghas	Sudan ghah
25.	Teosinte	<i>Euchlaena mexicana</i> Schrad.	—	—	Not known	Tiyosente	—	—	—	—	—	—	Makchari
26.	Oats	<i>Avena sativa</i> L.	Oat	Jai	Jaie ; Ota	Yavalu	Oat arisi	Oat	Thoke godhi	Jai	Jav	Jaie	Jaur ; Jaec
27.	Senll (Indian clover)	<i>Melilotus parviflora</i> Desv.	—	Banmethi	Barsim	—	—	—	—	—	—	Senji	Senji
28.	Kudzu vine	<i>Pueraria lobata</i> Ohwi	Kudzu-vine	Kudzu	Kudajnina	Kudju teege	—	—	Gamadi hullui	Kudzu	Kudzu	Kudzu	Kudzu vel.
29.	Para grass	<i>Panicum purpurascens</i> Raddi	Para ghah	Nardul	Ghara ghasa	Enumu-gaddi	Neerpul	—	Mauritius hullu	Para gavath	Para ghas	para ghas	Para ghah
30.	Tea	<i>Camellia thea</i> ; <i>Camellia sinensis</i> O Ktze.	Chah	Cha	Cha	Theyaku	Theyilai	Theyila	Tea	Chaha	Chah	Chaie	Chah

CONTENTS

	Page
FOREWORD	
PREFACE	... (i)
LIST OF ABBREVIATIONS	... (v)
GLOSSARY OF VERNACULAR NAMES OF CROPS	... (viii)
PUNJAB STATE	... 1
HIMACHAL PRADESH	... 7
JAMMU & KASHMIR	... 12
STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS	... 16
EXPERIMENTAL RESULTS (CROP-WISE)	
PUNJAB STATE	
Paddy	... 33
Wheat	... 51
Barley	... 181
<i>Bajra</i>	... 185
<i>Jowar</i>	... 190
Maize	... 203
Soyabean	... 235
Pulse crops (Gram, <i>Mash</i> and Cowpeas)	... 237
Vegetable crops (Potato, Sweet Potato & Colocasia)	... 250
Sugarcane	... 271
Cotton	... 371
Tobacco	... 436
Oilseed crops (Groundnut, <i>Sarson</i> , <i>Raya</i> , <i>Toria</i> and Linseed)	... 494
Fodder crops (Berseem, Lucerne, <i>Chari</i> , <i>Guara</i> , Sudan Grass, Teosinte, Oats, Rape, <i>Senji</i> , Kudzu Vine and Para grass)	... 527
Tea	... 580
Mixed cropping	... 582
HIMACHAL PRADESH	
Wheat	... 593
Barley	... 604
Potato	... 605
Berseem	... 618
JAMMU & KASHMIR	
Paddy	... 619
Wheat	... 658
Maize	... 671

PUNJAB

1. GENERAL

Punjab is one of the new North-Western territories of India which came into existence as a result of partition of India in August 1947. It is bound in the West by Punjab (Pakistan) and Bahawalpur States, on North by Kashmir, a block of Himachal Pradesh and Tibet and on East by river Jamuna. On Southern border it is bound by Rajasthan. According to Survey of India it has total area of 47,456 square miles lying between 27½° and 34° North.

There are three administrative divisions *viz.*, Ambala, Jullundur and Patiala. Punjab State has been divided into 18 districts, *viz.*, Hissar, Rohtak, Gurgaon, Karnal, Ambala, Hoshiarpur, Amritsar, Jullundur, Ludhiana, Ferozepur, Gurdaspur, Kangra, Simla, Patiala, Bhatinda, Sangrur, Kapurthala and Mohindergarh.

The main occupation of the State is agriculture, nearly 66.5% of the population being dependent upon it.

The total area of Punjab according to village records pertaining to agricultural year 1955-56 is 30,289,000 acres as per details given below :—

	Acres.
Area under forests.	844,000
Area not available for cultivation.	7,781,000
Cultivable waste other than current fallows	2,381,000
Current fallows.	1,489,000
Net area sown—	
(a) Irrigated.	8,062,000
(b) Unirrigated.	9,732,000
Total	<hr/> 30,289,000

2. PHYSICAL FEATURES

Physically, the state is divided into three natural divisions, namely (i) Himalayan, (ii) Sub-Himalayan and (iii) the Indo-Gangetic plain.

The Himalayan division includes Simla and Kangra districts *i.e.*, the country lying on the sides of outer range of Himalayas, whereas the Sub-Himalayan division is a narrow strip adjoining Himalayas called the sub-mountainous region where some of the spurs of Himalayas such as Shivaliks and the high hills of Kasauli and Dalhousie are situated. It is in the Sub-Himalayan region that Ambala, Hoshiarpur and Gurdaspur districts lie. The third region is the Indo-Gangetic plain comprising of the remaining 13 districts *viz.*, Hissar, Rohtak, Gurgaon, Karnal, Jullundur, Ludhiana, Amritsar, Ferozepur, Bhatinda, Patiala, Sangrur, Kapurthala and Mohindergarh.

There are only three principal snowfed rivers which came to the share of this State as a result of the partition of Punjab. They are Sutlej, Beas and a part of Ravi. These rivers, however, neither give access to the sea nor they are navigable even for medium sized crafts. In the early parts of their course amidst the snow-clad ranges, they do not serve any purpose; except that at Jogindernagar in Kangra district, water of the river Uhl, a tributary of Beas, which joins latter in Mandi district of Himachal Pradesh, is utilised to produce 48,000 kws. of electric power. In the plains too, even until the partition, these rivers were put to much use for the benefit of western part of Punjab. The Bhakra-Nangal Project over the river Sutlej now provides the main source of irrigation and electric power to this State.

3. SOILS

The land area of Punjab may be grouped as follows from several points of view and these groups reflect to a certain extent the type of vegetation and land use :—

- (1) The mountain tract.
- (2) Sub-mountain region and (3) Alluvial soil.

Agriculturally, the Himalayan tract is secondary in importance. The soils are not deep, but have well-developed profile. They are somewhat deficient in lime and phosphoric acid. Their reaction is acidic to neutral. The soils contain very little soluble salts. They are quite rich in humus. The soils of Punjab plain belong to the same class of alluvial soils, typical of Indo-Gangetic plains. Majority of the soils consist of soil crust of varying depths perched on a permanent sand stratum in which usually the water table is situated. The soil crust generally contains 10 to 15% clay and has an average depth of 10". The soils have generally an alkaline reaction due to the presence of sodium in the clay samples. Sodium salts are usually present in the soil crust and to control their movement is one of the major problems of the state. Chemically the soils are adequately supplied with mineral matter. They are deficient in organic matter and are low in nitrogen. Most of the soils of the plains are sandy loam to loam in mechanical composition. They have no definite profile characteristic and are structure-less. Soluble salts are found throughout the profile, *Kankar* (nodular CaCO_3) is usually met with in lower layers.

PEPSU Division consisting of 5 districts (Kapurthala, Bhatinda, Patiala, Sangrur and Mohidergarh) may be divided into two parts for the purpose of soil classification viz. hilly and plains. Soils of PEPSU plains can be divided into three broad categories viz. (i) *Dokar*. (ii) *Rausli* and (iii) *Bhur*. The *dokar* soil is a very stiff loam, blackish grey in colour and requires several waterings and ploughings and is considered to be the best of soils but it requires abundant rainfall and then yields bumper wheat crop. *Bhur* is a sandy soil consisting of *tibbas* and is generally not very productive. In Bhatinda district, the land is classed as *Karar* (hard loam requiring heavy rain to make it fertile). *Gasra* land is less harder than *Karar* requiring less rains and can grow almost anything. *Gasra* land situated on the plateau is called *Dair*. *Doshi* land is the land with surface of sand and hard ground beneath and *tibba* land is that of sandy soil. In Kapurthala, the following classes of soils are recognised :—(1) *Chapi*, (2) *Jhulari*, a land situated on the banks of nullah, (3) *Bet* or low lying river land—is a good loam soil and yields excellent crops, (4) *Rez* is the land always irrigable by flood water, (5) *Bona* is high lying land and is divided into three sub-classes viz., (a) *Nohi* which is a stiff loam; yielding good crops after heavy rain, (b) *Sawa*, lighter loam and (c) *Bhur* or sandy soils and (6) the *barari* lands are clayey soils and need good rainfall for the crop produced by them.

4. RAINFALL AND CLIMATE

There are two well-marked rainfall seasons in the State (i) the monsoon period lasting from middle of June till September on which the autumn crops and spring sowing periods depend and (ii) the Winter rains which fall early in January and although insignificant in amount, materially affect the prosperity of spring harvest. Since the monsoon gets exhausted in its passage over the great plains of Sindh and Rajasthan while west winds from Baluchistan pass over arid tracts and leave such moisture as they have collected on the western slopes of Sulemann range, Punjab has to depend largely on South winds from the Bay of Bengal. According to rainfall the state can be divided into three main natural divisions in each of which the general meteorological conditions are believed to be homogeneous. These are mountainous (Stations like Simla, Dalhousie and Dharmsala), the sub-montane region (Hoshiarpur, Pathankot etc.) and Plains.

The rainfall in the foot hills averages 30", but a large part of Punjab has rainfall under 20" a year and in the driest portion the rainfall amounts to only 4". The irrigated area is situated in the rainfall belt below 20".

The climate of Punjab, over the greater part of it, is of a most pronounced continental character, extreme summer heat alternating with great winter cold. The maximum temperature occurs in May and June and may be as high as 120°F. The minimum temperature occurs in January when at places the temperature comes down to freezing point.

5. IRRIGATION.

Punjab after partition came to inherit large tract of unirrigated areas. Out of a total of over 140 lakh acres of canal irrigated area in the United Punjab only 30 lakh acres (*i.e.* about 21%) came to its lot. In addition to the major Bhakra-Nangal Project which consists of 690 miles of main canals and branches and 2200 miles of distributaries which would provide irrigation to 48 lakh acres, several minor irrigation schemes and tube well schemes also are undertaken some of which have already been completed to irrigate nearly 48% of the total cultivable area in the State.

The total area under irrigation by different sources in 1955-56 is given in table 1 below :

TABLE 1

Table showing the area irrigated by different sources

	Acres
(1) By Canals.	5,338,000
(2) By wells and tanks.	2,680,000
(3) By other sources.	44,000
Total	8,062,000

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN

In the matter of food production, Punjab is the second largest wheat and gram producing area in the Union, third in barley and maize, fourth in bajra and sugarcane, while it produces considerable quantities of jowar, cotton, rice, rape, mustard and small quantities of tea, tobacco, groundnut and linseed. The production of cotton in Punjab amounts to one fifth of the total production in the country.

Area and production of principal crops (1956-57) are shown in table 2 below :

TABLE 2

Area, production and average yield per acre (figures for 1956-57)

Crop	Area ('000 acres)	Production ('000 tons)	Av. yield (lb./ac.)
1. Paddy.	733	277 (husked rice)	846
2. Maize.	1009	651	1445
3. Jowar.	706	45	143
4. Bajra.	2442	240	221.
5. Wheat.	4749	1814	855
6. Gram.	6079	1866	688
7. Barley.	591	186	705
8. Sugarcane (gur)	475	580	2735
9. Cotton.	1310	735 *	444
10. Groundnut.	148	43	651

* in '000 bales of 392 lb. each.

In *Kharif* season (15th April to 15th October) the main crops are Gram, Cotton, Sugarcane, Paddy and Maize. In *Rabi* season (15th October to 15th April) Wheat is the principal crop, while *tona* gram and barley also are grown as *rabi* crops.

The distribution of different crops among the districts is given below :

- Wheat :—Almost all districts, except Ambala, Kangra, Kapurthala and Mohindergarh account for 90% of the total production of the crop.
- Gram :—Hissar, Rohtak, Karnal, Ferozepur, Sangrur and Bhatinda districts produce more than 75% of the total.
- Paddy :—Karnal, Kangra, Ferozepur, Amritsar and Gurdaspur districts account for nearly 75% of the total.
- Bajra :—Hissar, Rohtak, Gurgaon and Mohindergarh are major bajra producing districts.
- Sugarcane:—Rohtak, Karnal, Ambala, Jullundur, Amritsar, Gurdaspur, Patiala and Sangrur produce gur accounting for about 66% of the total production.
- Cotton :—Ferozepur district alone accounts for about 41% of the total production. Hissar, Bhatinda, Sangrur and Amritsar are other districts which grow cotton.

7. AGRICULTURAL EXPERIMENTATION AND RESEARCH STATIONS

Besides the research work on plant breeding and evolving out new varieties of different crops the research work on agronomic problems is one of the main activities of the department of agriculture.

There were 32 experimental research stations which reported the agronomic experiments in the state for the period 1948-53. Kangra district has the maximum number of research stations *i.e.* eight in all. There are one or two research stations in each of the districts of Ferozepur, Ambala, Faridkot, Hissar and Ludhiana. The other research stations have been distributed among Jullundur, Gurdaspur and Gurgaon. Most of these research stations have sandy loam and clayey loam to loam soil.

Research on wheat, which is the main crop, is carried out mainly at farms in Jullundur and Gurdaspur districts. The other farms at Ambala, Karnal and Gummur also carry out research on wheat. Research on paddy is carried out at Rice Breeding Station, Gurdaspur. Research work on cotton is carried out at Faridkot, Abohar, Hansi and Jullundur and that on Sugarcane is concentrated at Sugarcane Research Stations at Jullundur and Gurdaspur. Experimentation on tobacco is mostly done at Ferozepur Research Station.

The table giving details of these research farms is appended. Research on fodder and grass crops is being done at Sirsa Farm.

8. EXPERIMENTS

There were 739 experiments available for the period 1948—1953 in the State.

The distribution of these experiments according to crops and types of treatments is given in table 3 below.

TABLE 3

The distribution of experiments according to crops and treatments tried.

	M	MV	C	CM	CV	CMV	I	IM	IMV	IC	IMC	IV	ICV	D	Total
Paddy	12	4	4	2	3	—	—	—	—	—	—	—	—	—	25
Wheat	132	3	11	7	3	—	2	—	—	—	—	—	—	1	159
Barley	5	—	1	—	—	—	—	—	—	—	—	—	—	—	6
Jowar	7	3	1	—	3	—	—	—	4	—	—	—	—	—	18
Bajra	4	—	—	1	—	—	—	1	—	—	—	—	—	—	6
Maize	35	—	7	4	—	—	—	—	—	—	—	—	—	—	46
Soyabean	1	—	2	—	1	—	—	—	—	—	—	—	—	—	4
Pulses	7	—	11	—	2	—	1	—	—	—	—	—	—	—	21
Potato	7	—	1	—	—	—	—	—	—	—	—	—	—	—	8
Sweet potato	2	—	12	—	—	—	1	—	—	—	—	—	—	—	15
Colacasia	2	—	5	—	—	—	—	—	—	—	—	—	—	—	7
Sugarcane	62	1	16	7	5	—	2	7	7	—	1	3	—	18	129
Cotton	36	1	11	16	5	—	1	2	—	1	3	2	—	1	79
Tobacco	33	—	32	—	—	—	4	—	—	7	—	—	—	1	77
Oilseeds	21	1	13	4	1	3	—	—	—	4	—	—	—	1	48
Berseem	26	—	2	1	—	—	1	—	—	—	—	—	—	5	35
Lucerene	—	—	5	1	1	—	—	—	—	2	—	—	—	—	9
Others	10	3	6	—	—	2	—	2	—	—	—	—	—	2	25
Tea	1	—	1	1	—	—	—	—	—	—	—	—	—	—	3
Total	403	16	141	44	24	5	12	12	11	14	4	5	2	27	720
															Mixed 15
															Rotational 4
															G. Total 739

From the table it is revealed that the maximum number of agronomic experiments was carried out on wheat crop which occupies the maximum area of nearly 5 million acres in the State and is the principal crop of the State. Very few experiments were reported for Bajra crop (only 6) although it occupies nearly 3 million acres in the State. Most of the experiments on this crop are plant breeding trials. The cereal crop which received attention next to wheat was Maize, there being 46 experiments on this crop. This crop, so far as area under it is considered, is the third in order among cereals.

Among commercial crops sugarcane received highest attention. There were 129 experiments reported on this crop. Cotton comes next although it occupies more than double the area under sugarcane. There were only 79 experiments conducted on this crop. Tobacco also received better attention and all the experiments on it were carried out at Ferozepur Research station. Only a few experiments were conducted on pulses.

So far as the types of treatments tried is concerned it is found that more than 50% of the experiments were of manurial type. Next in order was cultural type of experiments. On wheat crop alone nearly 85% of the experiments had manurial treatments, 75% of the experiments on Maize crop were also manurial. For other crops the experiments with manurial treatments accounted for about 30 to 50%.

In almost all the manurial experiments on Wheat, Maize, Bajra, Cotton, and Sugarcane the source of nitrogen was Ammonium Sulphate and for phosphoric acid, it was Super

Phosphate. The levels of nitrogen and phosphoric acid for the crops excepting sugarcane varied from (excepting 0 level) 25 lb./ac. to 75 lb./ac. The manures like F.Y.M. and mahwa cake were also tried for comparative merits in some of the experiments. These were applied to give about 100-150 lb./ac. of nitrogen. For sugarcane, the experiments were tried with varying doses of nitrogen from 100 lb. to 200 lb./ac. Wherever combinations of different fertilizers were tried, the fertilizers were N, P and K with sources as indicated above.

The Randomised Block design was widely adopted both for studying the comparative merits of different manures and fertilizers and factorial combinations. The confounded (incomplete block) designs were not utilized although there were very few experiments for three types of fertilizers (N, P and K) at three levels each (3^3 confounded). Split-plot designs were also utilized wherever there were cultural treatments and also when bulky manures like F.Y.M. and lime were tried.

In R.B.D. the number of plots per block varied from 2 to 11 normally, although there were few experiments with as many as 27 plots per block. In split-plot designs there were three splits in some of the experiments. The number of main-plots per replication varied from 2 to 6 at the most and the number of sub-plots per main-plot varied from 3 to 6. The number of replications varied from 4 to 6. The net plot size normally varied from 1/40th of an acre. to 1/80th of an acre. There were few experiments where even the plot size of 1/220th of an acre was adopted.

The results of experiments on cultivators' fields under Stewarts' scheme of I.C.A.R. and T.C.M. trials are also included in the compendium. The experiments under Stewarts' scheme on cultivators' fields were conducted in Ludhiana district on wheat during 1953-1954. These were about 46 in number. The experiments under this scheme in Patiala district of former PEPSU State during 1953-1954 on wheat were also conducted in cultivators' fields. The details of T.C.M. trials are given in the two reports published by the I.C.A. R. (1955) on paddy and wheat.

HIMACHAL PRADESH

1, GENERAL

Himachal Pradesh, one of the young States in the Indian Union came into existence in 1948 on the integration of some 30 hill States of the western Himalayas. Apart from the States of Chamba, Sirmur, Mandi, Suket and Rampur-Bushahr, the merged States were only tiny units, the largest in size being Rampur-Bushahr with an area of 3,439 square miles.

Himachal Pradesh lies on the route to Tibet. It is surrounded on the North and North-West by Jammu and Kashmir, on the North-East, South-West and West by Punjab, on the East by Tibet and on the South-East by Uttar Pradesh. It has a total area of 10,904 square miles.

Himachal Pradesh lies between North latitudes $30^{\circ} 30'$ and $33^{\circ} 10'$ and East longitudes $75^{\circ} 55'$ and $79^{\circ} 50'$. The territory is divided into 5 administrative districts of Mahasu, Sirmur, Mandi, Chamba and Bilaspur.

The revenue records of Himachal Pradesh account for an area of only 23.13 lakh acres, which is nearly 33% of the total geographical area of the State. The remaining 67% area is under high hills and thick forests, which have not been surveyed so far. A rough classification of the recorded area is as follows :—

	Area in acres
Forests	3,99,601
Barren and uncultivable land	69,387
Land put to non-agricultural uses and cultivable waste	90,792
Permanent pastures and grazing land	8,57,897
Current fallows	39,634
Other fallow land	17,386
Net area sown	6,78,663
Miscellaneous	71,518
Total.	23,12,648

It would be seen that only 6.79 lakh acres *i.e.*, nearly 29% of the area shown in the revenue records or 9.6% of the total geographical area, are available for cultivation. The holdings are, therefore, generally very small and the rewards from agriculture, poor. Cultivation is carried on wherever possible, both on hill slopes and in valleys.

2. PHYSICAL FEATURES

The State can broadly be divided into three regions :—(i) Outer Himalayan Region, (ii) Inner Himalayan Region and (iii) Alpine Pastures.

The boundaries of the Outer Himalayan region touch the plains of Punjab. The whole area abounds in valleys, and each group of villages is bounded by hills and streams. The Inner Himalayan region is thinly populated having high mountains and narrow valleys. The Alpine Pasture lands which remain under snow for about six months in the year, are very sparsely populated. Wherever cultivation is done, yaks are used for ploughing the fields. Most of the inhabitants migrate during the winter months to warmer parts and return to their homes only when snow begins to melt. The mountain system (excluding Bushahr) may be mapped out roughly into three portions : the chaurpeak and the spurs radiating from it, occupying the South-East corner ; the Simla range extending

from central Himalayas to the neighbourhood of Sabathuj and the mountains of the Sub-Himalayan series, running from north-west to south-east, and forming boundary of Ambala plains. The last mentioned group may be sub-divided into Sub-Himalayas proper and an outer range corresponding to the Shivalik hills of Hoshiarpur on the one side and of the Gangetic *Doab* on the other. The Sub-Himalayan and the Shivalik ranges form parallel lines, having between them an open space of varying width known as *Kiarda Dun*, a broad and well cultivated valley.

The principal rivers by which the drainage of the Simla Hills is effected are the Sutlej, the Pabar, the Gori or Giri Ganga, the Gambhar and the Sirsa. Sutlej enters Bushahr by a pass between two peaks and flows south-west through Bushahr, receiving the drainage from the central Himalayas on one side and from the Spiti hills on the other, till it reaches the border of Kulu. The Pabar which is one of the principal rivers of the Tons, rises in Bushahr having feeders on the southern slopes of both central Himalayas and the transverse Simla range. The Gori, or Giri Ganga rises in the hills north of the *Chaur*, and collecting the drainage of the whole tract between that mountain and the Simla range, flows in the south-west direction meeting the outer Himalayas, and turns sharply to the South-east near Sirmur. The Gambhar rises in the Dagshai hills,

3. SOILS.

The soils of Himachal Pradesh fall into five major zones ; Low Hills, Middle Hills, High hills, Mountain and Dry hills.

Low Hills zone:—This includes Pamta valley and covers Nahan tehsil of Sirmur district, parts of Arki, Kasumpti and Suni tehsils of Mahasu district, Solan and Ghumarwin areas of Bilaspur district, Mandi and Jogindernagar tehsils of Mandi district and Bhattiyah of Chamba district. The altitude of the area ranges from 1500 ft. to 3000 ft. above sea level ; and the soils are located mainly in the narrow valleys through which numerous hill streams flow.

The soils are mostly sandy loams, varying from light grey to brown in colour. They are not very deep and abound in pebbles stones and boulders. Irrigation facilities are available at a number of places and the soils are well drained. They are neutral and respond well to organic manures and chemical fertilizers.

Middle Hills zone:—This includes lower part of Rainka tehsil and the Ces-Giri area of Pachhad tehsil in Sirmur district, parts of Arki, Solan, Kasumpti, Suni, and Theog tehsils of Mahasu district, Sarkaghat, Sundernagar, Chacliot and part of Karsog tehsil in Mandi district and Chamba and part of Tissa tehsil of Chamba district. It lies over an altitude of 3000 ft. to 5000 ft. above sea-level.

The soils in this zone are located mostly on the hilly slopes which are of varying gradients. They vary from loam to silt-loam ; texture is medium fine and colour ranges from grey to black. On account of rapid sub-soil drainage they are susceptible to draught. The response to organic manures as well as fertilizers is good. The soil reaction varies from neutral to slightly acidic.

High Hills zone :—The zone comprises the upper parts of Rainka tehsil and the Trans-Giri area of Pachhad tehsil of Sirmur district, Theog, Jubbal, Chopal, and Rampur tehsils of Mahasu district, Karsog tehsil of Mandi and Bharmour, Chamba and Tissa tehsils of Chamba district. The altitude varies from 5000 ft. to 7000 ft. above sea-level.

The soils are of a very fine texture and darkish brown in colour. They vary from silt loam to dry loam, with little gravel percentage. They are often quite deep, the depth at some places being 60 ft. There are no irrigation facilities. The soils have good drainage and fertility is also quite high. They are rich in potassium and respond well to

nitrogenous and phosphatic fertilizers. They yield a very good crop of seed potato and temperate fruits. There is wide difference in the carbon and nitrogen content of the soil and rate of decomposition is low. The soil is acidic in reaction.

Mountainous zone:—The zone comprises of the high elevation tracts in Mahasu, Chamba and Sirmur districts, which vary in altitude from 7000 ft. to 10,000 ft. above sea level. The area is mostly under forests and only in some parts potato and temperate fruits are grown. There are good grazing grounds in the region.

The soils of this area are generally more shallow than those in High hills zone. They range from slightly acidic to moderately acidic. The surface drainage is very good, and the sub-soil drainage is fairly good. The carbon and nitrogen contents are very high.

Dry Hill zone :—Chini tehsil of Mahasu district and Pangri tehsil of Chamba district, where rainfall is almost negligible, form a separate zone called the Dry Hill zone. These areas are suitable for the cultivation of dry fruits.

4. RAINFALL AND CLIMATE.

Himachal Pradesh is largely a mountainous territory with an altitude ranging from 2000 ft. to 22,000 ft. and climatic conditions accordingly vary from the semi-tropical to semi-arctic. The climate in Beas valley is similar to that of Kangra and Shivalik area. The heat in summer is intense though less severe than that experienced in the plains of Punjab. The rainy season is heavy and prolonged. Winter is pleasant and bracing, with only a moderate variation in the day and night temperatures. Snow fall is rare. In the upper portions of Bhattiyat, adjoining the high range, the climate is temperate. The rainfall is very heavy, and in winter snow for some months to a considerable depth are covered as on main range.

In the Ravi valley, the climatic conditions vary with altitude. In the lower portion they are semi-tropical in character. The heat is more and rainy season well marked, while the winter is mild, and the snow fall light. In Chamba the average maximum temperature is about 80° F and the average minimum about 56° F, though temperatures of 108° F and 30° F have also been recorded. From there upwards the conditions are most severe and vary from temperate to semi-arctic.

In the Chandrabhaga valley the climate is temperate in summer and semi-arctic in winter. As the lowest altitude in the Pangri valley is 7000 ft., severe heat is never experienced. The summer is exceedingly mild and pleasant while owing to scanty rainfall, humidity is always low. The winter generally is very severe. Snowfall begins in October and after December the whole valley is under snow till March or April. Communications are sometimes cut off and the villages are completely isolated.

The yearly average rainfall in Chamba is about 50". The major portion of it falls during the summer months from June to September, the average being 25". The average precipitation between January and May is about 21". The remaining months of the year, i.e. from October to December, show an average of only 3 to 4". The rain fall is heaviest in the Dhaula, Dhav and Pangri ranges.

In Bhattiyat, south of Dhaula Dhar, the rains are heavy and the Ravi valley also receives a fair proportion of rain. The Brahmaur area has probably the lowest rainfall. Owing to the high altitude of the Pangri range the rain clouds deposit most of their burden on its southern slopes and only a part of the rain cloud reaches the Chandrabhaga valley, where it rains in heavy showers, during July and August. The yearly average is not more than 25".

In Simla hills, the monsoon rains are heaviest in the southern parts. The rainfall becomes less and less towards the south-west and north-east and is practically nil in the northern portion of Kanawa in Bushahr.

Along the valley of Sutlej as far east as Wangtu and on Pabar side of the watershed, the rainfall does not greatly vary from that at Simla (*i.e.* about 65"), but beyond Wangtu the difference is considerable, the rainfall becoming less and less as Shipki is approached, so that the climate of upper Kanawar is semi-arid. West of Wangtu the Sutlej valley has an annual rainfall of about 70". At Kilba, ten miles east of Wangtu, this drops to 43" and at Poe, same twelve miles from the border at Shipki to 16". The monsoon is spent before it reaches Chini. During summer months heat is intense along the Sutlej, and in the secluded valleys at low elevations. The Pabar valley is too hot, the temperature in inhabited places is moderate in summer, and in the Kanawar valley the winters are comparatively genial. The snow line varies with locality and is lower in the North than on the South side of hills.

5. IRRIGATION.

Out of the total cropped area of 1067 thousand acres in 1957-1958 about 161 thousand acres were irrigated (*i.e.* nearly 15%). The net irrigated area was 93 thousand acres.

The table I below shows the source-wise break up of the net area irrigated.

TABLE—I

Net area irrigated source-wise (1957-1958).

Source.	Area (acres).
(1) Wells.	63
(2) Other sources.	93,316
Total.	93,379

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN.

Rabi Crops :—The principal *rabi* crops are wheat, barley, paddy, peas, coriander and lentils.

Wheat :—It is the principal food crop, grown mostly at lower and mid-elevations. Wheat is grown generally as a rain-fed crop as very limited irrigation facilities are available.

Barley :—It is generally grown in *bakhal* lands.

Kharif Crops :—These consist mainly of maize, paddy, sugarcane, potato, millets and *bhang*. Maize is grown abundantly throughout the State and paddy is alternated with maize and is grown both as rainfed and irrigated crop.

Gram is grown on a small scale in Bilaspur district and some other areas of lower elevation. Sugarcane is grown in the valleys adjoining the plains, particularly in Paonter valley and parts of Sirmur and Sundernagar in Mandi district.

Potato is the most important cash crop of Himachal Pradesh. The rural economy largely depends on the seed potato produced for export which meets nearly 20% of the total seed requirements of the country. The production is concentrated mainly in Mahasu district, being more than 70% of the total quantity of seed potato produced in the State.

Two crops of potato are raised annually, but the summer crop is more important as 98% of total potato growing area is devoted to its cultivation.

Himachal Pradesh is best suited for cultivation of disease free ginger seed, but the acreage under the crop is small. It is grown mostly in Sirmur and Mahasu districts.

Fruits :—Apple, pear, peach, apricot and plum are the principal fruits grown in the State. Their cultivation is mostly confined to Kotgarh, Kotkhai Suburbs of Simla, Arki, Solan and Rampur-Bushahr in Mahasu district. Citrus fruits are also grown at places, mainly in the sub-montane parts of Sirmur and Mandi districts.

The table 2 below shows the area and production of different crops in the State.

TABLE 2.

Area and production of principal crops (1957-1958)

Crop	Area ('000 acres)	Production ('000 tons)	Av. yield in lb./ac.
1. Rice,	111.13	43.36	874
2. Maize.	285.43	69.99	549
3. Ragi.	38.34	8.20	479
4. Millets.	63.74	10.82	380
5. Wheat.	346.84	95.60	617
6. Barley.	77.32	15.86	459
7. Pulses.	72.53	13.25	
8. Potato.	27.61	27.26	2,222
9. Sugarcane (<i>gur</i>)	3.42	1.95	1,227
10. Ginger.	3.24	0.48	332
11. Chillies.	0.59	0.09	342
12. Tobacco.	2.20	0.37	377
13. Oilseeds.	11.65	1.10	
14. Cotton.	1.04	0.20 @	75*
15. Tea.	1.96	0.08	91

@ in 000 bales of 392-lb each. * in 000 lbs.

7. AGRICULTURAL EXPERIMENTATION AND RESEARCH STATIONS

There were only 5 agricultural farms which reported experiments for the period 1948-53. Bhangretu, Bhanota and Dhaulakua farms are situated in Mandi, Chamba and Sirmur districts respectively. The farms at Parala and Shilaroo are situated in Mahasu district. Shilaroo Farm conducts varietal agronomic trials on potato and produces disease-free, nucleus seed stock of potato. The other farms are engaged in conducting varietal and agronomic trials on cereals and multiplication of improved seed varieties.

8. EXPERIMENTS.

There were 28 experiments in all reported for the period 1948-53. These were distributed as shown below :

TABLE 3

Distribution of the experiments according to crops and types of treatments tried.

Crop/Type	M	MV	C	CV	Total
Wheat.	2	2	—	6	10
Barley.	1	—	—	—	1
Potato.	10	—	6	—	16
Berseem.	1	—	—	—	1
Total	14	2	6	6	28

JAMMU & KASHMIR

1. GENERAL

The State of Jammu and Kashmir with an area of 85, 861 square miles (*i.e.* 54 million acres) extends from 32° 17' to 36° 58' N—and from 73° 26' to 80° 30' E. It is situated east of Indus and west of Ravi. For administrative purposes, the state is divided into two regions : Kashmir (including the frontier district) and Jammu regions. In Kashmir—Srinagar, Baramulla, Anantnag and the frontier district of Ladakh ; In Jammu—Jammu—Kathua, Udhampur and Doda.

Agriculture is the main occupation of the people. But the soil is not fertile. Only 3.6 percent of the total area is cultivable and the remaining portion is full of mountains and deserts. The total amount of land actually under cultivation in the state is 2,069,767 acres.

2. PHEICAL FEATURES

The state shows two broad physical divisions : the south-western division through which flow Jhelum, Kishanganga and Chenab and the north-eastern division which comprises of the area drained by Indus and its tributaries. The south-western region may be divided into three parts : the belt of the outer hills, the middle mountains and the Kashmir valley. The north-eastern region has three administrative divisions, namely, Ladakh or Little Tibet, Baltistan which is called *Chira Bhotan* by the Kashmiris and Dardistan. The dividing line between the two regions is formed by the great central mountain range which runs from Nanga Parbat in a south-east direction for about 240 miles before it enters the territory of Lahaul.

3. SOILS

No detailed survey of the soils of the Jammu & Kashmir has been made. The available data are summarised below :

Locality	Nature	N	Available P ₂ O ₅	Available K ₂ O	CO ₂	Loss on ignition	pH	CaO	T.S.S.
Taparkarewa Tehsil Bera.	Saffron soil	.105	0.044	0.022	0.138	—	—	—	—
Srinagar	Garden soil.	0.12	0.023	0.016	0.23	—	—	1.48	—
Kishnoor	Saffron soil	0.049	0.17	0.70	—	5.07	7.3	6.97	0.086
Shilvat	—	0.404	0.224	2.556	—	—	—	—	—

Hoon* has carried out an investigation of soil profiles under Deodar, Blue Pine, Silver Fir and Chir in the hill forests of the main valley and Batote Range in Jammu. The Blue Pine soils of the Kashmir valley appear to belong to the podsol group. The Deodar soil of Batote belongs to the brown earth group. Hoon suggests that podsoles of Kashmir valley are more allied to the Kulu Coniferous soils of the podsol group than to the recognised type of podsol.

The Valley proper possesses a large area of alluvial soil, which may be divided into two classes; the new alluvium, found in bays and deltas of the mountain rivers ; and the old alluvium, lying above the banks of the Jhelum and extending as far as *Karewas* The

* Hoon R.C. : An investigation of soil profile under Deodar, Blue Pine, Silver Fir and chir. Indian Forest Records. Silviculture 3, 195.

first is of great fertility and every year is renewed and enriched by silt from the mountain streams. Upto the present, in spite of *lax* system of forest conservancy, the silt of the mountain streams is rich and dark in colour ; but the Sind river brings down increasing amount of sandy deposit, which is partly due to the reckless felling of trees.

The Kashmiris recognise four classes of soil. These are known as *Grutu*, *Bahil*, *Sekil* and *Dazanlad*. *Grutu* soil contains a large proportion of clay. It holds water, and in years of scanty rainfall is the safest land for rice. But if the rains become heavy, the soil cakes and the out-turn of the crop is poor. *Bahil* is rich loam of great natural strength and there is always a danger that by over-manuring the soil may become too strong and plant run to blade. *Sekil* is light loam with a sandy sub-soil and if there be sufficient irrigation and good rains, the out-turn of rice is always large. *Dazanlad* soil is chiefly found in low-lying area near the swamps, but it sometimes occurs in the higher villages also. Special precautions are taken to run off irrigation water when the rice plant shows signs of a too rapid growth and if these are taken in time, the out-turn in *dazanlad* land is sometimes very heavy. A peculiarity of this soil is that the irrigation water turns red in colour. Near the banks of Jhelum and in the vicinity of the Wular lake, is found a rich, peaty soil (*nambal*), which in years of fair rainfall yields enormous crops of rapeseed and maize. This will not produce rice and requires no manure. It is, however, custom to burn standing weeds and the strubble of the previous year's crop before ploughing.

The *karewas*, which form so striking feature in the scenery of the country, form the most part of *grutu* soil, with varieties distinguished by colour. The most fertile is the dark blackish soil known as *Surhzamin*, the red *Grutu* is the next best, while yellow soil is considered worst of all.

4. RAINFALL AND CLIMATE

The climatic conditions in Kashmir show great diversity due to marked differences in the altitude of various regions, the elevation varying from 1200 ft. at Jammu to 2500° ft. on the highest mountain peaks.

The mean daily temperature is the lowest in January and highest in June or July. At Sringar, the average for January is about 33° F, and for July, which is the hottest month about 74° F. The range of temperature between maximum and minimum is 25° to 75° F at Skardu, 3° to 65° F at Deas, 18° to 62° F at Leh and 37° to 85° F at Gilgit. The note-worthy features of the annual variation are the very rapid increase of temperature in March or April at the end of winter and an equally rapid decrease in October when skies clear after the south-west monsoon.

The precipitation is confined to two well-defined periods namely winter season from December to April, and south-west monsoon periods from June to September. The rainfall in October and November is small in amount and November is usually the driest month of the year. The cold season precipitation from December to March is chiefly due to storms from Persia and Baluchistan. These disturbances occasionally give very stormy weather in Kashmir with violent winds on the higher elevations and much snow.

5. IRRIGATION

The total area of the State is about 54 million acres. Out of this the culturable area is of the order of 2.1 million acres. The area under irrigation in 1955 was 744,000 acres.

With the completion of several new irrigation canals and lift irrigation projects, 47,225 acres of land was brought under cultivation.

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN

The principal crops are Paddy Maize, Cotton, Saffron, Tobacco, Millets, *Amarnath*, buck-wheat, pulses and sesamum in the autumn and Wheat, Barley, Poppy, Rape flax,

Peas and beans in the spring. In Kashmir rice and maize are main crops while in Jammu, wheat and maize are the main crops.

Rice :—Rice is grown throughout the entire Kashmir part of the State. There are a number of varieties of rice grown in Kashmir, but they may roughly be divided into two classes, the white and red. The white varieties are held in esteem, the best among them being the *basmati* and the *kanyum*.

Maize :—In importance, maize is second only to rice. Enormous crops are raised in the black peaty land bordering the banks of Jhelum, as also in the high tracts occupied by the *Guzar* graziers.

Another important millet is *Cheena* or *ping* (*panicum miliaceum*) which is very much like rice in appearance, but is grown on dry land.

Amarnath :—The *ganhar* or *amarnath*, with its fold, coral and crimson stalks and flowers is an exceedingly beautiful crop. It is frequently sown in rows in the cotton fields or on borders of maize plots.

Buek-Wheat :—*Trumba* or *buek-wheat* (*Fagopyrum esculentum*) is a very useful plant as it can be sown late in any soil.

Pulses :—Pulses till lately were not popular, only *mung* (*Phaseolus mungo*) was having some importance. The other pulses are *mah* (*Phaseolus radiatus*) and *methi* (*P. acenitigolium*.)

Oilseeds :—The principal oilseed is rape. Linseed is cultivated all over the valley, but best fields are on the lower slopes of mountains. *Til* is also a very common crop.

Cotton :—Cotton is grown up to certain elevations only. Its cultivation is concentrated mostly in the *Karewas* and low-lying rice land.

Wheat & Barley :—These are the major spring crops of the valley. From the point of view of area, barley is more important of the two.

Saffron :—It is cultivated in the vast plateau of Pampur.

Fruits :—Kashmir is a land of fruits and flowers. Apple, peas, vine, mulberry, walnut, hazel, cheug, peach, apricot, raspberry, gooseberry, currant, plum and strawberry are grown in most parts of the Valley.

The table below shows the area, production and yield per acre of the principal crops in the State.

TABLE 1.

Area production and yield per acre of the principal crops in Jammu & Kashmir (1957-58).

Crop	Area ('000 acres)	Production ('000 tons)	Yield (lb./ac.)
1. Paddy.	352	162	1031
2. Jowar.	1	—	—
3. Bajra.	32		630
4. Maize.	343	101	660
5. Small millets.	43	12	625
6. Wheat.	303	78	577
7. Barley.	41	11	604
8. Pulses.	12	3	560
9. Rape & Mustard.	45	11	548
10. Linseed.	23	5	487

7. AGRICULTURAL RESEARCH AND RESEARCH STATIONS

There are six experimental farms from which experiments for the period 1948-53 are available. The details of these research stations are given in the statement appended.

The Gramwala Tehsil farm conducts varietal and cultural experiments on Wheat and Maize. Tehsil farm, Kawa carries out research on Maize and fodder crops.

Khudwani farm conducts manurial, cultural and breeding experiments on paddy and also hybrid maize experiments. Rajhani farm conducts experiments on paddy, wheat, gram, barley and fodder crop. In Shalamar and Tabab-tillo experimental farms research is done on paddy, wheat, maize, vegetables, pulses and fruits.

8. EXPERIMENTS

There were 73 experiments reported from this State for the period 1948-53. They were distributed as shown below.

TABLE 2.
Distribution of experiments according to crops and types of treatments tried.

Crop	M	MV	C	CV	Total
1. Paddy.	31	2	4	13	50
2. Wheat.	9	4	5	3	21
3. Maize.	1	—	1	—	2
	41	6	10	16	73

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

PUNJAB

Sl. No.	Name of the Experimental Station	Location	Tract it represents	Year of establishment	Major crops	Soil type and soil analysis, if any	Normal rainfall (annual) in inches	Irrigation facilities	No. of experiments
1	2	3	4	5	6	7	8	9	10
1.	Abohar: Cotton Research Station, dist. Ferozepur.	Abohar Railway Station.	—	1949	Gram and Cotton.	Sandy loam to loam.	10"	Canal	9—Cotton.
2.	Ambala: Agricultural Station	Ambala, $\frac{1}{4}$ mile from Ambala city Railway Station.	Barani tract of sub-mountainous area	1945	Wheat, Sugarcane, Cotton, Maize, Gram, Jowar and Mash.	Clayey loam. Stiff clayey.	28"	Tubewell	13—Wheat. 5—Jowar. 5—Maize. 5—Sugarcane. 1—Cherry.
									29—Total.

**STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
PUNJAB (Contd.)**

1	2	3	4	5	6	7	8	9	10
3.	Faridkot : (i) Cotton Re- search station, M.A. Farm. (ii) Oilseeds Res. Station.	Distt. Bhatinda, 6 furlongs from Faridkot Railway Station.	—	1910	Cotton, Maize, Wheat, Oilseeds and fodder.	Loam. p.H. =8.20 Conductance =0.38 Organic Carbon =0.42 Available phos- phorous =High Calcium Carbo- onate =3.83	16"	Canal	(i) 5—Cotton. (ii) 4—Cotton. 2—Sarson. 1—Torla. <hr/> 7—Total.
4.	Ferozepur : Agri. Res. Stn.	Ferozepur, 3½ miles from Feroze- pur Cantt. Rly. Station.	Central zone of the state.	1927	Gram, Bajra and Tobacco.	Varies from clay loam to sandy loam.	18"	Persian wheel, tube-well and canal	77—Tobacco. 2—Bajra. 1—Gram. <hr/> 80—Total.
5.	Gummar : Dem. cum seed multiplication Farm. (Oilseeds sub-station).	Distt. Kangra, 9 miles from Jowala- mukhi Railway Station.	—	1940	Wheat, Oilseeds, Sugarcane, Paddy, Maize, Soyabean and Gram.	Clayey loam.	69"	N.A.	12—Wheat 1—Maize 2—Paddy <hr/> 15—Total.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.

PUNJAB (Contd.)

1	2	3	4	5	6	7	8	9	10
6.	Gurdaspur : (i) Sugarcane Res. Stn. (ii) Agri. Station. (iii) Rice Breeding Station.	Gurdaspur (i) & (ii) ½ mile from Gurdaspur Rly. Station. (iii) 1 furlong from Gurdaspur Rly. Station.	—	(i) N.A. (ii) 1910 (iii) 1950	(i) Sugarcane. (ii) Barley, Wheat, Maize, Cotton and Sugarcane. (iii) Paddy, Wheat and Gram.	Sandy loam to loam.	(i) 38" (ii) 38" (iii) 33"	(i) Tube-well. (ii) Tube-well. (iii) Canal.	(i) 14—Sugarcane. (ii) 35—Wheat. 11—Sugarcane. 8—Cotton. 11—Maize. 2—Berseem. 1—Senji. 1—Mash. 1—Paddy. <hr/> 70—Total. (iii) 12—Paddy.
7.	Gurgaon : (i) Barley Res. Station. (ii) Oilseeds Res. Station.	Gurgaon. (i) 3½ miles from Gurgaon Rly. Station.	South-eastern district of the state.	(i) 1940	(i) Barley, Wheat, Cotton, Bajra, Jowar, Brassica, Gram, Mung and Tobacco.	Sandy loam.	(ii) 25"	Pumping set.	(i) 4—Barley. 3—Wheat. 1—Brassica. <hr/> 8—Total. (ii) 5—Brown sarson. 4—Raya. <hr/> 9—Total.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.
PUNJAB (Contd.)

1	2	3	4	5	6	7	8	9	10
8.	Hansi : (i) Govt. Agri. Stn. (ii) Cotton Res. Station.	Distt. Hissar, 4½ miles from Hansi Railway Station.	South-Eastern district of the State	(i) 1914 (ii) 1941	(i) Wheat, Cotton, Sugarcane, <i>Methi</i> , Lucerene, and Barley etc. (ii) Cotton, Wheat and sorghum.	Loam to clay loam.	(i) 16.68". (ii) 15".	Canal	(i) 24—Cotton. 14—Wheat. 6—Sugarcane. 5—Gram. 4—Berseem. 1—Oats. 1—Sarson. 1—Maize. 1—Paddy. <hr/> 57—Total. (ii) 8—Cotton.
9.	Jacch : Govt. Seed Farm.	Distt. Kangra, Nurpur Road, ½ mile.	—	1949	Wheat.	Clayey soil.	60".	N.A.	3—Wheat

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
PUNJAB (Contd.)

1	2	3	4	5	6	7	8	9	10
10.	Jullundur. (i) Agri. Stn. (ii) Sugarcane Res. Stn.	Jullundur. ¼ mile from Jullundur Rly. Station.	Central Punjab tract.	(i) 1914 (ii) 1934	(i) Wheat, Cotton Sugarcane, Maize, Groundnut, Potato etc. (ii) Sugarcane.	(i) Loam, sandy loam and sandy. (ii) Loam and sandy loam. Organic carbon = 0.02 to 0.50% Nitrogen = 0.01 to 0.06% Ca Co ₃ = 0 to 0.50% p.H.=6.8 to 8.9 Exchangable cations =11.0 to 20.1 per 100 gms. of soil.	(i) 28%. (ii) 29%.	(i) Tube-well (ii) Tube-well.	(i) 41—Wheat. 4—Sugarcane. 17—Maize. 4—Groundnut. 6—Berseem. 1—Bajra. 7—Potato. 10—Colacasia. 7—Cotton. 15—Sweet potato. 9—Cotton. ----- 121—Total. (ii) 77—Sugarcane.
11.	Kangra : Distt. and Demonstration Farm.	Kangra		N.A.	Wheat and Maize	Loamy, clay-loam.	N.A.	Kuhai	11—Wheat. 4—Soyabean. 3—Maize. 1—Linseed. ----- 19—Total.

**STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
PUNJAB (Contd.)**

1	2	3	4	5	6	7	8	9	10
12.	Karnal: Agri. Farm.	Karnal, 3 miles from Karnal Rly. Stn.	—	1929	Sugarcane, Cot- ton, Barley and Wheat.	Clayey loam.	30"	Canal.	12—Wheat. 4—Sugarcane. 7—Barseem. 2—Cotton. 1—Maize. 1—Gram. <hr/> 27—Total.
13.	Katrian : Vegetable Res. Stn.	Distt. Kangra, 128 miles from Nagrota Rly. Stn.	—	1944	Vegetables and Maize.	Sandy loam to loam.	60"	N.A.	5—Maize.
14.	Kulu : Cereal Breeding Sub-Station.	Distt. Kangra.	—	N.A.	Wheat		N.A.	N.A.	3—Wheat. 2—Potato. <hr/> 5—Total.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.

PUNJAB (Contd.)

1	2	3	4	5	6	7	8	9	10
15.	Nagrota Bagwan : (i) Linseed Breeding sub-station. (ii) Oilseed sub-station. (iii) Rice Breeding sub-station.	Distt Kangra. (i) ½ mile from Nagrota Rly. Stn. (ii) 1 mile from Nagrota Rly. Stn. (iii) 1 mile from Nagrota Rly. Stn.	Kagra valley	(i) 1945 (ii) 1945 (iii) 1936	(i) Linseed, Wheat and Soyabean (ii) Linseed and Soyabean. (iii) Rice, Wheat and Maize.	(i) Clay loam. (ii) " " (iii) Loam to clayey loam.	(i) 100% (ii) " " (iii) " "	Kuhal	(i) 2—Maize 12—Linseed 1—Soyabean. ----- 15—Total. (ii) 1—Linseed (iii) 2—Wheat. 4—Paddy. ----- 6—Total.
16.	Palampur : Govt. Tea Farm.	Distt. Kangra. 3 miles from Morinda Rly. Stn.	—	1938	Tea.	Red clayey.	100%	N.A.	3—Tea.
17.	Rauni : Bhupindra Agril. Farm.	Distt. Patiala. 5 miles from Patiala Rly. Stn.	—	1923	Wheat, <i>Jowar</i> , Millets, <i>bajra</i> , Gram, Oats, Cotton, Oilseeds, Sugarcane, Rice, Pulses etc.	Clayey with Kallar patches.	24%	Canal.	4—Wheat. 7—Cotton. 2—Sugarcane. 1—Berseem. 1—Potato. 2—Paddy. 2—Maize. ----- 19—Total.

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

PUNJAB (Contd.)

1	2	3	4	5	6	7	8	9	10
18.	Rohtak :	Dist. Rohtak.	3 Haryana tract-Plains.	1928	Wheat, Cotton and Sugarcane.	Sandy loam and clayey loam. Soil analysis :	18"	Canal	(i) 1—Groundnut. (ii) 2—Berseem. 1—Bajra. 2—Wheat. 1—Groundnut. 1—Jowar. 1—Kabuli gram. <hr/> 8—Total. (iii) 4—Wheat. 5—Berseem. 7—Gram. 5—Sugarcane. 3—Bajra. 2—Jowar. <hr/> 26—Total.
	(i) Millet Sub-Station.	miles from				(i) <i>Chemical analysis</i> :			
	(ii) Soil Sub-Station.	Rohtak Rly. Stn.				Total P ₂ O ₅ =0.0854 to 0.1178			
	(iii) Agri. Farm.					„ K ₂ O =0.63 to 0.96			
						„ CaO =0.61 to 1.02			
						„ Sodium Na ₂ O =0.48 to 0.64			
						„ Ca CO ₃ =0.11 to 0.37			
						„ Mg =0.091 to 0.109			
						Av. P ₂ O ₅ =0.0277 to 0.031			
						„ K ₂ O =0.0159 to 0.0209			
						Av. Calcium =0.134 to 0.3220			
						(ii) <i>Mechanical analysis</i> :			
						Clay 9 to 27%			
						Silt 18 to 34%			
						Fine sand 38 to 39%			
						Org. matter 1.0 to 1.47%			
						p.H. 7 to 8			

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
PUNJAB (Contd.)

1	2	3	4	5	6	7	8	9	10	
19.	Samrala : Groundnut Exptl. Farm.	Distt. Ludhiana. 7 miles from Khanna Rly. Stn.	—	1946	Groundnut.	Sandy. Soil analysis : (i) <i>Chemical analysis</i> : Organic matter=0.131 to 0.296 Total Nitrogen=0.035 to 0.042 Av. P ₂ O ₅ =0.0049 to 0.0080 pH=7.30 (ii) <i>Mechanical analysis</i> :	26"	Well, but most of the area is bar- ren.	16—Groundnut.	
						Depth	Course sand %	Fine Sand %	Silt %	Clay %
						0 — 6"	57.65	22.80	10.32	6.48
						6" — 12"	47.60	23.55	15.06	10.04
						12" — 24"	40.65	22.92	16.88	14.20

STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS.
PUBJAB (Contd.)

1	2	3	4	5	6	7	8	9	10
20.	Sirsa : Fodder Res. Stn.	Dist. Hissar Rly. Stn. Sirsa.	Arid districts of the state	1934	Jowar, Sudangrass. Moth, Fodder-crops.	Loam to medium loam. Soil analysis (i) <i>Chemical analysis</i> :	12"	Canal	10—Jowar. 13—Berseem. 9—Oats. 5—Teosinte. 2—Sudan grass. 6—Rape. 1—Cherry grass. 7—Lucerne. 2—Maize cowpeas. 1—Jowar. 1—Guara. 2—Senji. 2—Kudzu vine. 1—Cowpeas. 1—Meh-u. 1—Peregrass. <hr/> 64—Total.
						Iron Al. pentoxide = 7.98 % CaO = 2.53 % Available P ₂ O ₅ = 0.067% K ₂ O = 0.725% Available K ₂ O = 0.033% Phosphorous as P ₂ O ₅ = 0.227% Nitrogen = 0.67 % Calcium carbonate = 2.00 % Organic matter = 0.68 % (ii) <i>Mechanical analysis</i> : Coarse sand = 1.78 % Fine sand = 69.00 % Silt = 13.60 % Clay = 12.20 % Moisture = 0.74 %			

**STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
HIMACHAL PRADESH**

1	2	3	4	5	6	7	8	9	10
1.	Bhangrotu : Agri. Farm.	Distt. Mandi. 4 miles from Jogindernagar Rly. Stn.	—	1949	Wheat, Rice, Maize, Sugarcane etc.	Medium to hard.	60°	—	2—Wheat.
2.	Bhanota : Agri. Farm.	Distt. Chamba. 67 miles from Pathankot Rly. Station.	—	1949	Wheat, Rice, Maize and other crops.	Loam to sandy loam. Chemical and mechanical analysis on table I & II	40°	Kuhal	2—Wheat.
3.	Dhaura Kuan : Agri. Res. Stn.	Distt. Sirmur. 76 miles from Ambala cantt. and 45 miles from Jagadhari.	Low hills and valley area	1949	Wheat, Maize, Barley, Sugarcane etc.	Sandy loam. Soil analysis : (i) Chemical analysis : Total N=0.095 to 0.117% ,, P=0.126 to 0.219% ,, K=0.099 to 0.162% ,, OM=0.81 to 1.78% p.H=6.0 to 7.1 Available N=130 to 200 lb./ac. ,, P=20 to 50 lb./ac. ,, K=40 to 100 lb./ac. (ii) Mechanical analysis :- N.A.	60°	Deisel pump	1—Wheat. 1—Barley. 1—Berseem. <hr/> 3—Total.

HIMACHAL PRADESH (Contd.)

1	2	3	4	5	6	7	8	9	10
4.	Parala : Agri. Farm.	Distt. Mahasu 28 miles from Simla Rly. Stn.	Sub-tropical tract	1948	Cereals.	Sandy loam intermingled with stones.	50"	<i>Kuhal.</i>	1—Wheat.
5.	Shilaroo : Potato Dev. Stn.	Distt. Mahasu 32 miles from Simla Rly. Stn.	High hills tract	1949	Potato.	Loam to clay loam.	70"	Nil	4—Wheat. 16—Potato. <hr/> 20—Total.

Table I

Showing the Chemical characteristics of the soils from Seed Multiplication *Cum* Demonstration Farm, Bhanota

Horizon depth in inches	Chemical analysis (% on air dry basis)							Exchangeable basis in %		
	Organic carbon	Total Nitrogen	p.H.	Total Cao	Total sesquixoides	Total P ₂ O ₅	Total K ₂ O	Exchange Capacity	Exchangeable Cao.	Exchangeable K ₂ O
Representative Surface Samples :-										
0-9 Field No's 1 and 2	0.675	0.042	5.9	0.266	7.15	0.073	0.318	7.28	5.4	0.54
0-9 Field No. 3	0.645	0.073	6.1	0.252	4.90	0.114	0.357	6.60	5.2	0.48
0-9 Field No. 4	0.765	0.067	5.9	0.252	5.60	0.134	0.346	6.40	5.2	0.75
0-9 Field No. 5	0.645	0.050	6.3	0.224	5.00	0.103	0.335	6.40	5.6	0.54
0-9 Field No. 6, 7 and 8	0.600	0.039	6.3	0.196	5.00	0.076	0.308	6.0	5.5	0.54
Profile Sample from field No. 2 :-										
0-9	0.585	0.034	6.1	0.252	4.00	0.063	0.246	5.16	4.9	0.30
9-28	0.285	0.034	6.8	0.350	5.40	0.082	0.346	9.00	6.6	0.15
28-38	0.270	0.022	6.9	0.336	5.50	0.133	0.320	8.80	5.9	0.14
38-60	0.240	0.020	7.1	0.406	12.75	0.136	0.280	13.80	11.2	0.34
Profile Samples from field No. 3 :-										
0-9	0.645	0.065	6.1	0.238	9.40	0.151	0.329	8.68	4.9	0.22
9-33	0.315	0.039	6.6	0.322	4.85	0.145	0.275	8.60	6.4	0.31
33-48	0.240	0.028	6.9	0.322	5.00	0.145	0.312	9.20	4.8	0.56
48-60	0.345	0.045	6.9	0.364	6.65	0.183	0.306	9.20	8.1	0.56

Table II

Showing the Physical characteristics of the soils from Seed Multiplication cum Demonstration Farm, Bhanota.

Horizon Depth in inches ; Physical description	Colour	Gravel %	Mechanical analysis (% on air dry basis)				
			Coarse Sand	Fine Sand	Silt	Clay	Texture
Representative Surface Samples :—							
0—9 Representative surface sample from Field No. 1 and 2.	5y 6/3 (Pale olive)	12.38	8.540	40.785	34.6	15.4	Loam.
0—9 Representative surface sample from field No. 3	10 y R 6/3 (Pale brown)	26.67	20.600	41.255	22.3	15.2	Loam.
0—9 Representative surface sample from field No. 4	2.5 y 6/2 (Lt. brown gray)	20.83	17.570	44.665	25.0	12.0	Loam.
0—9 Representative surface sample field No. 5	10 yR 6/3 (Pale brown)	21.24	23.675	45.680	19.8	10.2	Sandy loam.
0—9 Representative surface sample from field No. 6, 7 and 8	10 yR 6/3 (Pale brown)	11.94	24.730	37.870	21.2	15.6	Loam.
Profile Samples from field No. 2							
0— 9 Pale brown, sandy loam, compact	10 yR 6/3 (Pale brown)	17.24	18.000	45.615	26.0	9.8	Sandy loam.
9—28 Pale olive, loam, compact	5y 6/3 (Pale olive)	14.71	11.215	49.200	29.2	10.1	Loam.
28—38 Pale brown loam, compact, concretions present	10y R 6/3 (Pale brown)	39.37	25.460	31.870	19.3	23.1	Loam.
38—60 Light yellowish brown, clay loam, compact, concretions present ; water logged	10 yR 6/4 (Lt. yellowish brown)	7.41	2.610	39.450	31.4	26.3	Clay loam.

Contd.

Table II (Contd.)

Profiles Sample from field No. 3							
0— 9 Pale brown, loam, compact, grass roots present	10 yR 6/3 (Pale brown)	20.65	19.755	40.800	22.0	16.8	Loam.
9—33 Pale brown, loam, compact	10 yR 6/3 (Pale brown)	23.22	20.600	42.485	21.9	14.7	Loam.
33—48 Pale brown, loam, concretion present	10 yR 6/3 (Pale brown)	25.64	29.600	37.060	20.8	12.3	Loam.
48—60 Pale brown, loam, hard, compact.	10 yR 6/3 (Pale brown)	27.27	23.600	43.055	20.9	12.1	Loam.

**STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
JAMMU & KASHMIR.**

S. No.	Name of the Experimental Station	Location	Tract it represents	Year of establishment	Major crops	Soil Type	Normal Rainfall	Irrigation facilities	No. of experiments
1	2	3	4	5	6	7	8	9	10
1.	Gramwala : Tehsil Farm.	Tehsil Reasi. Distt. Udhampur 120 miles from Pathankot Rly. Stn.	—	1952	Wheat and Maize.	Sandy loam,	32"	—	1—Wheat. 2—Maize. <hr/> 3—Total.
2.	Kawa : Tehsil Farm Udhampur.	Tehsil Udhampur Distt. Udhampur 114 miles from Pathankot Rly. Station.	—	1952	Paddy, Wheat, Maize and fodder crops.	Sandy loam.	32"	—	1—Paddy.
3.	Khudwani : Paddy Exptl. Farm.	Tehsil Kulgam, Distt. Anantnag. 238 miles from Pathankot Rly. Station.	—	1941	Paddy and Hybrid maize.	Clayey loam.	25"	—	44—Paddy.

JAMMU & KASHMIR (Contd.)

1	2	3	4	5	6	7	8	9	10
4.	Rajhani : Tehsil Farm Kathua.	Tehsil Kathua, Distt. Kathua 15 miles, from Pathankot Rly. Station.		1952	Paddy, Wheat. Gram, Barley and fodder.	Sandy loam.	40"	—	2—Wheat.
5.	Shalamar : Provincial Exptl. Farm.	Tehsil Srinagar Distt. Srinagar, 281 miles from Pathankot Rly. Station.		1910, as Pratap Model Farm ; 1952 as Prov. Exptl. Farm.	Paddy, Wheat, Maize, Vegetables, Pulses and fruits.	Loam.	25"	—	5 Paddy. 5—Wheat. ----- 10—Total.
6.	Talab-Tilloo : Central Provincial Exptl. Farm.	—							13—Wheat.

Crop :- Paddy (*Khari*).
Site :- Oil seed Sub.-Stn., Gummar.

Ref :- Pb. 48 (76).
Type :- 'M'.

Object :—To study the effect of A/S and Ammo. Phos. on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 14 to 19.7.1948. (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) N.A. (v) Nil. (vi) *Lal Nikanda*. 41 (medium). (vii) Unirrigated. (viii) N.A. (ix) 60.07". (x) 27.10.1948.

2. TREATMENTS :

1. Control (no manure).
2. 30 lb./ac. of N as A/S.
3. 30 lb./ac. of N as Ammo. Phos.
Fertilizers applied on 25.8.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/20 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c)—. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1006 lb./ac.
(ii) 354.9 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1012
2.	993
3.	1014
S.E./mean	= 158.7 lb./ac.

Crop :- Paddy (*Khari*).
Site :- Oil seed Sub. Stn., Gummar.

Ref :- Pb. 51 (141).
Type :- 'M'.

Object :—To study the effect of A/S and Super alone and in combination on the yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 28 and 29.7.1951. (iv) (a) N.A. (b) Transplanting. (c)—. (d) N.A. (e) N.A. (v) Nil. (vi) *Lal Nikanda-41* (medium). (vii) Unirrigated (viii) N.A. (ix) 40.89" approx. (x) 8.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)
(1) 2 levels of N as A/S : $N_0=0$ and $N_1=50$ lb./ac.
(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) —. (c)—. (v) (a), (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 516.5 lb./ac.
(ii) 88.27 lb./ac.
(iii) Only P effect is significant.

(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	Mean
N ₀	430.3	521.1	475.7
N ₁	438.9	675.4	557.2
Mean	434.6	598.3	516.5

S.E. of any marginal mean = 36.04 lb./ac.
 S.E. of body of table = 50.96 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(66).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To find out the best manurial treatment to Paddy crop.

1. BASAL CONDITIONS :

(i) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22,23.7.1953. (iv) (a) 5 ploughings, 2 puddlings and 4 *sohaga*. (b) N.A. (c) 9 sr./ac. (d) 9"×9". (e) N.A. (v) Nil. (vi) 349 *Jhona* (medium), (vii) Irrigated. (viii) One weeding on 10.8.1953. (ix) 27.58". (x) 15.10.1953.

2. TREATMENTS :

- Control (no manure).
 - 100 lb./ac. of N as A/S
 - 50 lb./ac. of N as A/S + 50 lb./ac. of P₂O₅ as Super.
 - 100 lb./ac. of N as A/S + 50 lb./ac. of P₂O₅ as Super.
 - 100 lb./ac. of N as A/S + 100 lb./ac. of P₂O₅ as Super.
 - 100 lb./ac. of N as A/S + 100 lb./ac. of P₂O₅ as Super + 25 lb./ac. of K₂O as Pot. Sul.
- A/S, Super and Pot. Sul. broadcast on 11.7.1953, 22.7.1953 and 7.9.1953 respectively.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 18'×79'. (b) 18'×75'-9". (v) Approx. 3' on one side and 1'-9" on the other side of the length of each plot left out as non experimental area. (vi) Yes.

4. GENERAL :

(i) Normal; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—continuing. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Number of treatments increased after 1953.

5. RESULTS :

- 3187 lb./ac.
- 356.7 lb./ac.
- Treatments are significantly different.
- Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2502
2.	3327
3.	3103
4.	3295
5.	3486
6.	3410
S.E./mean	= 178.4 lb./ac.

Crop :- Paddy.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 53(119).
Type :- 'M'.

Object :—To find out the manurial formula for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Mash*, (c) Nil. (ii) (a) Heavy loam. (b) N.A. (ii) 24.7.1953. (iv) (a) 1 *raja*, 2 *desi* plough and 2 roller. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) 349 *Jhona* (medium). (vii) Irrigated. (viii) 3 weedings on 3,27.8.1953 and 10.9.1953. (ix) 2.57". (x) 19.10.1953.

2. TREATMENTS :

1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.
4. 50 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Super.
5. 100 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super.
6. 100 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super + 12½ lb./ac. of K₂O as Pot. Sul.
Super broadcast on 23.7.1953, A/S and Pot. Sul. broadcast on 6.8.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 13'×52'. (b) 13'×49'—3.3". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good ; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3895 lb./ac.
- (ii) 292.4 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3165
2.	3532
3.	4065
4.	4004
5.	4319
6.	4284
S.E./mean	=146.2 lb./ac.

Crop :- Paddy.
Site :- Cereal Breeding Sub-Stn. Kulu.

Ref :- Pb. 52(25).
Type :- 'M'.

Object :—To study the effect of fertilizer on the growth and yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.7.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) 5-43 (early, improved). (vii) Irrigated. (viii) N.A. (ix) 7.04". (x) N.A.

2. TREATMENTS :

- All combinations of (1) and (2)
- (1) 3 levels of N as A/S : N₀=0, N₁=45 and N₂=60 lb./ac.
 - (2) 2 levels of P₂O₅ as Super : P₀=0, P₁=50 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 33'×5½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2427 lb./ac.
 (ii) 110.1 lb./ac.
 (iii) Only N effect and interaction N×P are highly significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	Mean
N ₀	2175	2253	2214
N ₁	2391	2715	2553
N ₂	2623	2407	2515
Mean	2396	2458	2427

S.E. of marginal mean of N = 55.1 lb./ac.
 S.E. of marginal mean of P = 45.0 lb./ac.
 S.E. of body of table = 77.9 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(43).

Site :- Cereal Breeding Sub.-Stn., Kulu.

Type :- 'M'.

Object :- To study the effect of fertilizers on the growth and yield of Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.7.1953. (iv) (a) N.A. (b) Transplanting. (c)—. (d) Row to row 9". and plant to plant 3". (e) N.A. (v) N.A. (vi) S—43 (*Dundar* improved, early). (vii) Irrigated. (viii) 2-3 weedings. (ix) 14.25". (x) 30.10.1953.

2. TREATMENTS :

All possible combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=45 and N₂=60 lb./ac.

(2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.

Half of A/S at the time of transplanting and half after one month of transplanting by broadcast.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 33'×5½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Yield of grain in lb./ac. (iv) (a) 1952-1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2381 lb./ac.
 (ii) 223.8 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	Mean
N ₀	2160	2222	2191
N ₁	2407	2407	2407
N ₂	2623	2469	2546
Mean	2397	2366	2381

S.E. of marginal mean of N = 111.9 lb./ac.
 S.E. of marginal mean of P = 91.4 lb./ac.
 S.E. of body of table = 158.2 lb./ac.

Crop :-Paddy (*Kharif*).

Ref :-Pb. 53 (273).

Site :-Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To find out suitable time of applying A/S to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) Clay. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) N.A.

2. TREATMENTS :

1. Control.
2. 25 lb./ac. of N placed deep before transplanting.
3. 25 lb./ac. of N applied 15 days after transplanting.
4. 25 lb./ac. of N applied one month after transplanting.
5. 25 lb./ac. of N applied $\frac{1}{2}$ as in Tr. 3 and $\frac{1}{2}$ as in Tr. 4.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 8.727 lb./plot.
- (ii) 1.305 lb./plot.
- (iii) Treatments do not differ significantly.
- (iv) Av. yield of grain in lb./plot.

Treatment	Av. yield
1.	7.764
2.	8.643
3.	9.394
4.	9.116
5.	8.687
S.E /mean	=0.5328 lb./plot.

Crop :-Paddy.

Ref :-Pb. 52 (19).

Site :-Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To find out suitable dose of A/S for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Paddy—Wheat. (b) Wheat. (c) 300 md./ac. of F.Y.M. (ii) (a) Clayey loam. (b) N.A. (iii) 2.7.1952. (iv) (a) Two-dry ploughings before transplanting. (b) Transplanting. (c) —. (d) and (e) N.A. (v) No. (vi) *Ramjawain*. 100 (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 53.30°. (x) 3.10.:952.

2. TREATMENTS :

1. Control.
 2. 15 lb./ac. of N as A/S.
 3. 30 lb./ac. of N as A/S.
 4. 45 lb./ac. of N as A/S.
 5. 60 lb./ac. of N as A/S.
- A/S broadcast on 18.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 13'6"×26'6". (b) 12'×25'. (v) 9" border area on each side. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Attack of rice hispa, sprayed with gammaxene on 12.8.1952. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1700 lb./ac.
- (ii) 237.6 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1366
2.	1690
3.	1917
4.	1907
5.	1621
S.E./mean	=97.0 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(38).

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To find out suitable dose of A/S for Paddy crop.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Wheat. (b) Wheat. (c) 300 md./ac. of F.Y.M. (ii) (a) Clay loam. (b) N.A. (iii) 4.7.1953.
- (iv) (a) 2 *desi* plough. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) No. (vi) *Ramjawain*. 100 (medium)
- (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 77.72". (x) N.A.

2. TREATMENTS :

- 1. Control (no manure).
 - 2. 15 lb./ac. of N as A/S.
 - 3. 30 lb./ac. of N as A/S.
 - 4. 45 lb./ac. of N as A/S.
- A/S broadcast on 15.7.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 9'-6"×31'-6". (b) 8'×30". (v) 9" on all sides of each plot. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) No. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil.
- (vii) Upland rice land. Poor soil.

5. RESULTS :

- (i) 1948 lb./ac.
- (ii) 248.1 lb./ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1750
2.	1789
3.	2197
4.	2054
S.E./mean	= 101.3 lb./ac.

Crop :- Paddy.

Ref :- Pb. 52(20).

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To find out a suitable method of application of A/S to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.6.1952. (iv) (a) 3 ploughings. (b) Transplanting. (c)—. (d) and (e) N.A. (v) 200 md./ac. of F.Y.M. broadcast with the first ploughing in the month of April 1952. (vi) *Ramjawain*. 100 (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 58.30". (x) 3.10.1952.

2. TREATMENTS :

1. Control (no manure).
2. Deep application before transplanting (on 25.6.1952) by drilling A/S with plough.
3. Surface application of A/S broadcast 15 days after transplanting (11.8.1952).
4. Deep application 15 days after transplanting (11.7.1952) by pellets prepared by mixing A/S with soil.
5. Surface application of A/S in the month of August (17.8.1952.) by broadcast.
6. Deep application of A/S in August (17.8.1952) by pellet method.
A/S applied at 25 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 8' × 20'. (b) 1/363th of an acre. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) No. (iii) No. of tillers per plant, grain yield. (iv) (a) 1952-1954 (continued with modification). (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Standing crop in 2 to 4 treatment plots distinctly dark green than in other plots and also greater in height.

5. RESULTS :

- (i) 3158 lb./ac.
 (ii) 250.1 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2859
2.	3582
3.	3034
4.	3283
5.	3131
6.	3057
S.E./mean	= 102.1 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(39).

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To find out suitable method of applying A/S to Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Fallow-Paddy-Fallow. (b) Fallow. (c) No. (ii) (a) Loam. (b) N.A. (iii) 1.7.1953. (iv) (a) 3 ploughings. (b) Transplanting. (c)—. (d) to (e) N.A. (v) 200 md./ac. of F.Y.M. broadcast in April 1953. (vi) *Ramjawain*. 100 (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 77.72." (x) N.A.

2. TREATMENTS :

1. Control (no manure.)
2. 25 lb./ac. of N as A/S applied deep, before transplanting by drilling behind the plough.
3. 25 lb./ac. of N as A/S surface application 15 days after transplanting by broadcast.
4. 25 lb./ac. of N as A/S deep application, 15 days after transplanting by pellet method.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 8" × 15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954 continued with modification). (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5 RESULTS :

- (i) 4975 lb./ac.
 (ii) 756.0 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	4644
2.	5313
3.	4932
4.	5009
S.E./mean	=308.6 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(109).

Site :- Chemical Section, B.A. Farm, Rauni.

Type :- 'M'.

Object :—To study the best manurial formula along with time of its application for Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 7,8,7.1953. (iv) (a) 5 ploughings and 4 planking. (b) N.A. (c) 10-12 sr./ac. (d) 9" x 9". (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) One weeding. (ix) 23.69". (x) 28.10.1953.

2. TREATMENTS :

Main-plot treatments :

7 manures : $M_0=0$, $M_1=30$ lb./ac. of N as A/S, $M_2=60$ lb./ac. of N as A/S, $M_3=90$ lb./ac. of N as A/S, $M_4=M_1+30$ lb./ac. of P_2O_5 as Super, $M_5=M_2+60$ lb./ac. of P_2O_5 as Super, and $M_6=M_3+90$ lb./ac. of P_2O_5 as Super.

Sub-plot treatments :

2 times of application of manures : T_1 =Whole of Super + $\frac{1}{2}$ of A/S applied at puddling and $\frac{1}{2}$ A/S given as top dressing after one month of transplanting and T_2 =Whole of Super and A/S applied at puddling time.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (v) (a) 1/70 ac. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Stand very good. Crop partially lodged due to high velocity wind on 4.9.1953. (ii) Rice bug attack on 28.8.1953; 10% B.H.C. dusted on 5,7,9.1953. (iii) Grain yield. (iv) (a) Not continued. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1786 lb./ac.
 (ii) (a) 580.7 lb./ac.
 (b) 374.8 lb./ac.
 (iii) Only sub-plot treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	Mean
T_1	—	1713	2305	2179	1787	1858	1970	1969
T_2	—	1948	1803	2044	1344	1501	1710	1725
Mean	1421	1831	2054	2112	1565	1679	1840	

S.E. of difference of two.

1. M marginal means =290.3 lb./ac.
 2. T marginal means =100.1 lb./ac.
 3. T means at the same level of M =265.0 lb./ac.
 4. M means at the same level of T =345.6 lb./ac.

Crop :- Paddy.

Ref :- Pb. 52 (13)

Site :- Rice Breeding Sub. Stn., Gurdaspur.

Type :- 'MV'.

Object :—To determine the optimum dose of N in the form of A/S for different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 12, 13.6.1952. (iv) (a) 4 ploughings, 3 *sohaga*. (b) N.A. (c) 12 sr./ac. (d) 9'×9'. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weeding. (ix) 22.15'. (x) 19.9.1952 and 7.10.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Jhona$ 349 (early) and $V_2=Basmati$ 370 (late).(2) 5 levels of N : $N_0=0$, $N_1=20$, $N_2=40$, $N_3=60$ and $N_4=80$ lb./ac.
N as A/S broadcast on 10.7.1952.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'×79'. (b) 8.25'×75'-5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield data. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1400 lb./ac.

(ii) 263.9 lb./ac.

(iii) V effect is highly significant. N effect is significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
V_1	1544	1760	2214	1974	1958	1890
V_2	659	839	954	1022	1069	909
Mean	1102	1300	1584	1498	1514	1400

S.E. of marginal mean of V = 59.0 lb./ac.

S.E. of marginal mean of N = 93.3 lb./ac.

S.E. of body of table = 131.9 lb./ac.

Crop :- Paddy.

Ref:- Pb. 53 (32).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'MV'.

Object :—To determine the optimum dose of N in the form of A/S for different Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Lentils-Paddy-Lentils. (b) Lentils. (c) No. (ii) (a) Sandy. (b) N.A. (iii) 2.7.1953. (iv) (a) 1 *raja* plough, 3 *desi* plough. (b) N.A. (c) Approx. 10 sr./ac. (d) 9'×9'. (e) N.A. (v) No. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 25.43'. (x) 14.10.1953 and 26.10.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Jhona$, 349 (early) and $V_2=Basmati$, 370 (late).(2) 5 levels of N : $N_0=0$, $N_1=20$, $N_2=40$, $N_3=60$ and $N_4=80$ lb./ac.
Half A/S broadcast at the time of transplanting and half on 22.7.1953.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'×80'. (b) 8.25'×75'-5", (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1144 lb./ac.
 (ii) 167.8 lb./ac.
 (iii) All the effects are highly significant.
 (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
V ₁	1063	1348	1523	1444	1418	1359
V ₂	516	674	853	1160	1435	928
Mean	790	1011	1188	1302	1427	1144

S.E. of marginal mean of V = 37.5 lb./ac.
 S.E. of marginal mean of N = 59.3 lb./ac.
 S.E. of body of table = 83.9 lb./ac.

Crop :- Paddy.

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Ref :- Pb. 52(14).

Type :- 'MV'.

Object :- To find out the best source of N in combination with different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 21.7.1952. (iv) (a) One *raja* plough-*desi* plough, 3 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) 9"×9". (e) N.A. (v) No. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings. (ix) 22.19". (x) 22.10.52 to 7.11.52.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V₁=Jhona 349 (early) and V₂=Basmati 370 (late).

(2) 5 manures : M₀=0, M₁=50 lb./ac. of N as A/S, M₂=50 lb./ac. of N as G.N.C., M₃=50 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio and M₄=*Dhaincha* G.M. (details N A.).

Manures applied at the time of planting.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'×79' (b) 8.25'×75'-5" (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory ; no lodging. (ii) Nil. (iii) Yield data. (iv) (a) Yes, 1951-1954. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1186 lb./ac.
 (ii) 217.5 lb./ac.
 (iii) Only M effect and interaction M×V are highly significant.

(iv) Av. yield of grain in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	Mean
V ₁	1044	1505	1109	1393	1321	1274
V ₂	756	968	1468	1341	1008	1098
Mean	900	1236	1264	1367	1164	1186

S.E. of marginal mean of V = 48.6 lb./ac.
 S.E. of marginal mean of M = 76.9 lb./ac.
 S.E. of body of table = 108.8 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(33).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'MV'.

Object :- To find out the best source of N in combination with different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Lentils—Paddy—Lentils. (b) Lentils. (c) Nil (ii) (a) Sandy loam. (b) N.A. (iii) 29.7.1953.
 (iv) (a) 3 *raja* plough, 3 *desi* plough. (b) Transplanting. (c) —. (d) —. (v) No. (vi) As per treatments.
 (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 25.43". (x) 26,31.10.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V₁=*Jhona* 349 (early) and V₂=*Basmati* 370 (late).(2) 5 manures : M₀=0, M₁=50 lb./ac. of N as A/S, M₂=50 lb./ac. of N as G.N.C., M₃=50 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio and M₄=*Dhaincha* G.M. (details N.A.).

Manures applied at the time of planting.

3. DESIGN

(i) R.B.D. (Fact.). (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'×80': (b) 8.25'×75'-5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal ; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 561.4 lb./ac.

(ii) 119.94 lb./ac.

(iii) M effect is significant, V effect is highly significant while MV is not significant.

(iv) Av. yield of grain in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	Mean
V ₁	249.4	393.8	288.8	367.6	315.0	322.9
V ₂	625.7	770.1	857.6	901.4	844.5	799.9
Mean	437.6	582.0	573.2	634.5	579.8	561.4

S.E. of marginal mean of V = 26.82 lb./ac.
 S.E. of marginal mean of M = 42.40 lb./ac.
 S.E. of body of table = 59.97 lb./ac.

Crop :- Paddy.

Ref :- Pb. 52(16).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'C'.

Object :- To determine the optimum seed rate in the nursery and best age of seedlings at the time of transplanting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat and Gram. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 3.5.1952, 10.5.1952, 17.5.1952, 24.5.1952/21, 22.6.1952. (iv) (a) 5 Ploughings. 4 *sohaga*. (b) Transplanting. (c) As per treatments. (d) N.A. (e) N.A. (v) 18 C.L. of F.Y.M. on 7.6.1952 ; 3 md. of gram *bhusa* on 15.6.1952 and 25 sr. of A/S on 14.7.1952. broadcast. (vi) 349 *Jhona* (early). (vii) Irrigated. (viii) 3 weedings. (ix) 22.19". (x) 21.9.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 ages of seedlings : $A_1=4$, $A_2=5$, $A_3=6$ and $A_4=7$ weeks.

(2) 3 seed rates : $R_1=80$, $R_2=160$ and $R_3=240$ sr./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 9.75' x 82'. (b) 9' x 80.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1954. (b) No. (c) Nil. (v) (a) No. (b) (vi) and (vii) Nil.

5. RESULTS :

(i) 1058 lb./ac.

(ii) 184.9 lb./ac.

(iii) Only A effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
A_1	1093	954	977	1008
A_2	1098	1317	1169	1195
A_3	1103	1121	1011	1078
A_4	1035	1002	817	951
Mean	1082	1099	994	1058

S.E. of marginal mean of A

=47.7 lb./ac.

S.E. of marginal mean of R

=41.3 lb./ac.

S.E. of body of table

=82.7 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(35).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'C'.

Object—To determine the optimum seed rate in the nursery and best age of seedlings at the time of transplanting.

1. BASAL CONDITIONS :

(i) (a) Paddy—wheat ($\frac{1}{2}$ portion) and Paddy-fallow ($\frac{1}{2}$ portion). (b) Fallow, wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 7.7.1953. (iv) (a) 1 *raja* plough and 2 *desi* plough. (c) As per treatments. (d) 9" x 9". (e) N.A. (v) No. (vi) 349 *Jhona* (early). (vii) Irrigated (viii) 3 weedings and 2 or 3 hoeing. (ix) 25.43". (x) 23.10.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 ages of seedlings : $A_1=4$, $A_2=5$, $A_3=6$ and $A_4=7$ weeks.

(2) 3 seed rates : $R_1=80$, $R_2=160$ and $R_3=240$ sr./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $80' \times 10.5'$. (b) $74'-5" \times 9.75'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield only. (iv) (a) 1950—1954 (with some modifications) (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 817.3 lb./ac.

(ii) 132.75 lb./ac.

(iii) A effect is highly significantly. R effect is significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	Mean
A_1	769.1	604.1	487.7	620.3
A_2	1054.3	1046.8	975.5	1025.5
A_3	757.9	716.6	622.8	699.1
A_4	983.0	885.4	904.2	924.2
Mean	891.1	813.2	747.6	817.3

S.E. of marginal mean of A

=38.32 lb./ac.

S.E. of marginal mean of R

=33.19 lb./ac.

S.E. of body of table

=66.37 lb./ac.

Crop :-Paddy.

Site :-Rice Breeding Sub.-Stn., Gurdaspur.

Ref :-Pb. 52 (18).

Type :-'C'.

Object :-To find the best spacing and optimum number of plants per hill.

1. BASAL CONDITIONS :

(i) (a) Wheat—Paddy—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.7.1952. (iv) (a) 4 Ploughing—3 *Sohaga*. (b) N.A. (c) 10-12 sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) 349 *hona* (early). (vii) Irrigated. (viii) 2 weedings. (ix) 22.19". (x) 25.10.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings : $S_1=6" \times 6"$, $S_2=9" \times 9"$ and $S_3=12" \times 12"$.

(2) 3 No. of seedlings/hill : $P_1=1$, $P_2=2$ and $P_3=3$ seedlings/hill.

3. DESIGN :

(i) Fact. in R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) $80' \times 10'11"$. (b) $75'7\frac{1}{2}" \times 9'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal ; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1954 (contd. with modification). (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS ,

(i) 1121 lb./ac.

(ii) 168.6 lb./ac.

(iii) All the effects are highly significant.

(iv) Av. yield of grain in lb./ac.

	P ₁	P ₂	P ₃	Mean
S ₁	1210	1665	1558	1478
S ₂	1051	960	1141	1051
S ₃	719	902	882	834
Mean	993	1176	1194	1121

S.E. of any marginal mean = 39.7 lb./ac.
 S.E. of body of table = 68.8 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53 (110).

Site :- Chemical Section, B.A. Farm, Rauni.

Type :- 'C'.

Object :- To study the effect of No. of seedlings and spacing on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 14, 17.7.1953. (iv) (a) 5 ploughings — 4 *sohaga*. (b) N.A. (c) 10-12 sr./ac. (d) and (e) As per treatments. (v) 1 md./ac. of A/S. broadcast on 20.8.1953. (vi) 370 *Basmati* (medium). (vii) Irrigated. (viii) One hoeing. (ix) 23.69". (x) 28.10.1953.

2. TREATMENTS :

Main-plot treatments :

3 No. of seedlings/hill : P₁=1, P₂=2 and P₃=4 seedlings/hill.

Sub-plot treatments :

3 spacings : S₁=6"×6", S₂=9"×9", and S₃=12"×12".

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 22'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Crop partially lodged due to high velocity winds on 4.9.1953. (ii) Severe [attack of rice bug 10% B.H.C. dusted 7.9.1953. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) Nil. (v) (a) No. (b) — (vi) and (vii) Nil.

5. RESULTS :

(i) 2939 lb./ac.

(ii) (a) 448.3 lb./ac.

(b) 410.4 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P ₁	P ₂	P ₃	Mean
S ₁	2721	3327	2988	3012
S ₂	2649	3201	3045	2965
S ₃	2906	2592	3024	2841
Mean	2759	3040	3019	2939

S.E. of difference of two

1. P marginal means = 211.3 lb./ac.

2. S marginal means = 193.4 lb./ac.

3. S means at the same level of P = 335.1 lb./ac.

4. P means at the same level of S = 345.7 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(37).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'CV'.

Object :- To know the best spacing of seedling and optimum number of seedlings per hill.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Paddy-Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 24.7.1953. (iv) (a) 1 *raja* plough, 3 *desi* plough-2 plankings. (b) Transplanting. (c)—. (d) and (e) As per treatments. (v) 48 seer of A/S broadcast on 19.8.1953. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 25.43". (x) 26.10.1953 for V_1 and 1.11.1953 for V_2 .

2. TREATMENTS :

Main-plot treatments :

2 varieties : $V_1=249$ *Jhona* (early) and $V_2=S-20$ (late).

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 spacings : $S_1=6''$, $S_2=9''$ and $S_3=12''$.(2) 3 no. of seedlings/hill : $P_1=1$, $P_2=2$ and $P_3=3$ seedlings/hill.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 75.63' x 6' (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1309 lb./ac.
(ii) (a) 552.5 lb./ac.
(b) 265.5 lb./ac.
(iii) V effect is significant. S and P effects are highly significant, while all other effects are not significant.
(iv) Av. yield of grain in lb./ac.

	P_1	P_2	P_3	Mean	V_1	V_2
S_1	1416	1593	1674	1561	1262	1860
S_2	1002	1383	1530	1305	964	1646
S_3	948	990	1248	1062	760	1364
Mean	1122	1322	1484	1309	995	1623
V_1	818	938	1230	995		
V_2	1426	1706	1738	1623		

S.E. of marginal mean of S or P = 54.2 lb./ac.

S.E. of body of table = 93.9 lb./ac.

S.E. of difference of two

1. V marginal means = 130.2 lb./ac.
2. S or P means at the same level of V = 108.4 lb./ac.
3. V means at the same level of S or P = 157.5 lb./ac.

Crop :- Paddy.

Ref :- Pb. 52(17).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'CV'.

Object :—To study the effect of noded seedlings on yield of Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Wheat-Paddy. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 19.7.1952. (iv) (a) 3 ploughings and 2 *sohaga*. (b) and (c) N.A. (d) 9"×9". (e) N.A. (v) 5 C.L. of F.Y.M. on 11.7.1952., 16 sr. of A/S on 1.8.1952 and 30 seers of A/S on 20.8.1952 broadcast. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings. (ix) 22.19". (x) 16.10.1952., 6.11.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1 = \text{Jhona}$. 349 (early) and $V_2 = \text{Basmati}$. 370 (late).(2) 2 types of seedlings : $S_1 = \text{Un-noded}$ and $S_2 = \text{Noded}$ seedlings.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 6'-9"×80'. (b) 6'×72.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1954. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1413 lb./ac.

(ii) 195.7 lb./ac.

(iii) All the effects are highly significant.

(iv) Av. yield of grain in lb./ac.

	S_1	S_2	Mean
V_1	1839	1236	1538
V_2	1352	1224	1288
Mean	1596	1230	1413

S.E. of any marginal mean = 56.5 lb./ac.

S.E. of body of table = 79.9 lb./ac.

Crop :- Paddy.

Ref :- Pb. 53(36).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'CV'.

Object :—To study the effect of noded seedlings on yield of Paddy crop .

1. BASAL CONDITIONS :

(i) (a) Gram-Paddy-Gram. (b) Gram. (c) Nil. (ii) (a) Sandy Loam. (b) N.A. (iii) 31.7.1953. (iv) (a) *Raja* plough—3 *desi* plough—2 planking. (b) to (e) N.A. (v) 48 seer/ac. of A/S broadcast on 19.8.1953. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 25.43". (x) 2.11.1953 for V_1 and 8.11.1953 for V_2 .

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 varieties : $V_1 = \text{Jhona}$. 349 (early) and $V_2 = \text{Basmati}$. 370 (late).(2) 2 types of seedlings : $S_1 = \text{Unnoded}$ and $S_2 = \text{noded}$ seedlings.

3. DESIGN :

(i) R.B.D. (Fact). (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 80'×10.5'. (b) 74'-5"×9.75'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal, no lodging. (ii) Nil. (iii) Yield only. (iv) (a) 1950 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS ;

(i) 1124 lb./ac.
 (ii) 90.7 lb./ac.
 (iii) All the effects are highly significant.
 (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	Mean
V ₁	1231	810	1021
V ₂	1253	1201	1227
Mean	1242	1006	1124

S.E. of any marginal mean = 26.2 lb./ac.
 S.E. of body of table = 37.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- Pb. 52(15).

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Type :- 'CM'.

Object :- To find the best combination of transplanting dates, N, P₂O₅ and spacing on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Wheat-Paddy. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughing—4 *sohaga* and puddling. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) No. (vi) *Jhona* 349—(early). (vii) Irrigated. (viii) 3 weeding. (ix) 22.19". (x) 20.9, 4.10 and 6.11.1952.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=15.6.1952, D₂=5.7.1952 and D₃=25.7.1952.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=40 and N₂=80 lb./ac.

(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.

Sub-Sub-plot treatments :

3 spacings : S₁=6" × 6", S₂=9" × 9" and S₃=12" × 12".

3. DESIGN :

(i) Split-Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot and 3 Sub-Sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 62' × 6'. (b) 60' × 6'. (v) One foot on two sides of each plot left out. (vi) Yes.

4. GENERAL :

(i) Normal ; no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1170 lb./ac.
 (ii) (a) 1204.3 lb./ac.
 (b) 337.4 lb./ac.
 (c) 139.5 lb./ac.
 (iii) D effect is significant. N, S effects and interactions D × S, D × N × S are highly significant. No other interaction is significant.

(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	S ₁	S ₂	S ₃	Mean
D ₁	977	1060	1059	1032	1049	1015	1124	1042	930	1032
D ₂	1278	1630	1874	1592	1544	1647	1796	1612	1375	1594
D ₃	559	878	1214	877	846	929	1120	809	723	884
Mean	938	1189	1382	1167	1146	1197	1347	1154	1009	1170
S ₁	1095	1404	1542	1357	1319	1365				
S ₂	947	1147	1369	1146	1146	1171				
S ₃	773	1017	1237	998	974	1055				
P ₁	976	1194	1331							
P ₂	920	1170	1349							
P ₃	919	1204	1468							

S.E. of marginal mean of N or P = 37.5 lb./ac.

S.E. of body of table N×P = 64.9 lb./ac.

S.E. of difference of two

1. D marginal means = 189.2 lb./ac.
2. S marginal means = 21.9 lb./ac.
3. N or P means at the same level of D = 91.8 lb./ac.
4. D means at the same level of N or P = 352.5 lb./ac.
5. S means at the same level of D = 38.0 lb./ac.
6. D means at the same level of S = 191.8 lb./ac.
7. S means at the same level of N or P = 38.0 lb./ac.
8. N or P means at the same level of S = 61.6 lb./ac.

Crop :- Paddy.

Site :- Rice Breeding Sub-Stn., Gurdaspur.

Ref :- Pb. 53 (34).

Type :- 'CM'.

Object :- To find the best combination of transplanting dates, N, P₂O₅ and spacing on yield of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Paddy-Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments.
 (iv) (a) 1 *raja* plough-2 *desi* plough-2 planking. (b) and (c) N.A. (d) As per treatments. (e) N.A.
 (v) No. (vi) 349 *Jhona* (early). (vii) Irrigated. (viii) 3 weedings. (ix) 28.01". (x) 12,16.10.1953 ; 16.10.1953 ; 28.10.1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of planting : D₁=15.6.1953, D₂=5.7.1953 and D₃=25.7.1953.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=40, and N₂=80 lb./ac.(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.

Sub-Sub-plot treatments :

3 spacings : S₁=6'×6", S₂=9'×9" and S₃=12'×12".

3. DESIGN :

- (i) Split-Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) sub-plot 25'×62'. (b) sub-sub-plot 6'×60'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1177 lb./ac.
(ii) (a) 727.0 lb./ac.
(b) 151.3 lb./ac.
(c) 160.9 lb./ac.
(iii) Effects of D, S, N and interactions $D \times P$, $S \times P$, $N \times P \times S$, $D \times N \times S$ and $S \times P \times D$ are highly significant. Interaction $D \times N$ is significant.
(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	P ₀	P ₁	P ₂	S ₁	S ₂	S ₃	Mean
D ₁	1279	1660	1714	1481	1595	1577	1710	1548	1396	1551
D ₂	943	1365	1551	1359	1212	1287	1483	1299	1077	1286
D ₃	426	786	873	602	734	750	972	688	425	695
Mean	883	1270	1379	1147	1180	1205	1388	1178	966	1177
S ₁	1051	1511	1603	1301	1430	1434				
S ₂	901	1278	1356	1164	1214	1156				
S ₃	697	1022	1179	977	896	1024				
P ₀	829	1264	1349							
P ₁	931	1222	1388							
P ₂	888	1325	1400							

S.E. of marginal mean of N or P	= 16.8 lb./ac.
S.E. of body of table $N \times P$.	= 29.1 lb./ac.
S.E. of difference of two	
1. D marginal means	= 114.3 lb./ac.
2. S marginal means	= 25.3 lb./ac.
3. N or P means at the same level of D	= 41.2 lb./ac.
4. D means at the same level of N or P	= 119.1 lb./ac.
5. S means at the same level of D	= 43.8 lb./ac.
6. D means at the same level of S	= 119.7 lb./ac.
7. S means at the same level of N or P	= 43.8 lb./ac.
2. N or P means at the same level of S	= 42.9 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48 (42).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :- To study the effect of different sources of N on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 4.11.1948. (iv) (a) and (b) N.A.
(c) 35 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C. 591 (medium). (vii) Irrigated. (viii) Nil. (ix) 7.68".
(x) 20.4.1949.

2. TREATMENTS :

- Control.
- 30 lb./ac. of N as F.Y.M.
- 30 lb./ac. of N as A/S.
- 30 lb./ac. of N as Ammo. Phos.
- 60 lb./ac. of N as F.Y.M.
- 60 lb./ac. of N as A/S.
- 60 lb./ac. of N as Ammo. Phos.
- 30 lb./ac. of N as F.Y.M.+30 lb./ac. of N as A/S.
- 30 lb./ac. of N as F.Y.M.+30 lb./ac. of N as Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1949. (b) No (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1509 lb./ac.
 (ii) 187.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1254
2.	1382
3.	1554
4.	1666
5.	1484
6.	1602
7.	1536
8.	1452
9.	1652
S.E./mean	= 93.9 lb./ac.

Crop :- Wheat.

Site :- Distt. and Demonstration Farm, Ambala.

Ref :- Pb. 49(73).

Type :- 'M'.

Object :- To study effect of different sources of N on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 9.11.1949. (iv) (a) and (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Hoeing on 21.1.1950. (ix) 5.33". (x) 19.4.1950.

2. TREATMENTS :

- Control.
- 30 lb./ac. of N as F.Y.M.
- 30 lb./ac. of N as A/S.
- 30 lb./ac. of N as Ammo. Phos.
- 60 lb./ac. of N as F.Y.M.
- 60 lb./ac. of N as A/S.
- 60 lb./ac. of N as Ammo. Phos.
- 30 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as A/S.
- 30 lb./ac. of N as F.Y.M.+30 lb./ac. of N as Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 20'×60.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair, no lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1948-49. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1768 lb./ac.
 (ii) 410.8 lb./ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1589
2.	1711
3.	1568
4.	1499
5.	1706
6.	1780
7.	2234
8.	2033
9.	1792
S.E./mean	= 205.4 lb./ac

Crop :- Wheat.

Ref :- Pb. 50(82).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 1.11.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.88". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2) + a Control.

(1) 3 sources of N : S_1 =F.Y.M., S_2 =A/S and S_3 =Ammono. Phos.(2) 2 doses of N : M_1 =16 lb./ac and M_2 =25 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 1/60th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 885.1 lb./ac.

(ii) 148.0 lb./ac.

(iii) S effect is highly significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=825.4 lb./ac.			
	M_1	M_2	Mean
S_1	726.4	768.9	747.6
S_2	973.3	1019.6	996.4
S_3	910.3	972.0	941.1
Mean	870.0	920.2	895.1

S.E. of marginal mean of S = 42.73 lb./ac.
 S.E. of marginal mean of M = 34.89 lb./ac.
 S.E. of body of table = 60.44 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(154).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Very hard clay. (b) N.A. (iii) 2.11.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 14.2". (x) 11.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)+a Control.

(1) 3 sources of N : S_1 =F.Y.M., S_2 =A/S and S_3 =Ammono. Phos.(2) 2 doses of N : M_1 =16 lb./ac. and M_2 =25 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain & straw yield. (iv) (a) 1952—1953. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1850 lb./ac.

(ii) 532.3 lb./ac.

(iii) All the effects are highly significant.

(iv) Av. yield of grain in lb./ac.

Control =1490 lb./ac.

	M_1	M_2	Mean
S_1	1518	1615	1566
S_2	1781	1765	1773
S_3	1453	3330	2392
Mean	1584	2237	1910

S.E. of marginal mean of S =153.7 lb./ac.

S.E. of marginal mean of M =125.5 lb./ac.

S.E. of body of table =217.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53 (228)

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find the best source of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 6.11.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 6.95". (x) 26.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)+a Control.

(1) 3 sources of N : S_1 =F.Y.M., S_2 =A/S and S_3 =Ammono. Phos.(2) 2 doses of N : M_1 =16 lb. and M_2 =25 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 11'×66'. (b) 11'×66'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952-1953. (b) No. (c)—. (v) (a) No. (b)— (vi) and (vii) Nil.

5. RESULTS:

- (i) 2330 lb./ac.
 (ii) 661.1 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

Control =230.1 lb./ac.

	M ₁	M ₂	Mean
S ₁	2434	2291	2362
S ₂	2349	2345	2347
S ₃	2271	2318	2294
Mean	2351	2318	2334

S.E. of marginal mean of S =190.1 lb./ac.

S.E. of marginal mean of M =155.8 lb./ac.

S.E. of body of table =269.9 lb./ac.

Crop :-Wheat.

Ref :-Pb. 53 (229).

Site :-Distt. and Demonstration Farm, Ambala.

Type :-'M'.

Object :—To study the suitability of C/N in comparison with A/S for Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 22.12.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated: (viii) N.A. (ix) 6.95". (x) 4.5.1954.

2. TREATMENTS:

All combinations of (1) and (2)+a Control (no manure)

(1) Two sources of 40 lb./ac. of N: N₁=A/S and N₂=C/N.

(2) Two doses of P₂O₅ as Super: P₀=0 and P₁=20 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/24th ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) No lodging. (ii) N.A. (iii) Grain and straw yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1552 lb./ac.
 (ii) 311.2 lb./ac.
 (iii) Only 'Control vs other treatments' effect is significant.

(iv) Av. yield of grain in lb./ac.

	Control = 1173 lb./ac.		
	P ₀	P ₁	Mean
N ₁	1660	1717	1688
N ₂	1546	1663	1604
Mean	1603	1690	1686

S.E. of any marginal mean = 110.0 lb./ac.

S.E. of body of table = 155.6 lb./ac.

Crop :-Wheat (*Rabi*).

Site :-Oilseed Sub-Stn., Gummar.

Ref :-Pb. 49 (102).

Type :-'M'.

Object :—To study the effect of application of fertilizers on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e) —. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) Nil. (ix) 14.02". (x) N.A.

2. TREATMENTS :

- Control (no manure).
- 24 lb./ac. of N as A/S.
- 24 lb./ac. of N as A/S and 30 lb./ac. of P₂O₅ as Super.
- 30 lb./ac. of P₂O₅ as Super.
- 24 lb./ac. of N and 30 lb./ac. of P₂O₅ as Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 1/46th ac., 2/85th ac., 1/45th ac., and 1/48th ac. for each replication. (v) Nil. (vi) Yes.

4. GENERAL

(i) Yes. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS

- (i) 648.4 lb./ac.
(ii) 167.08 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	560.5
2.	653.0
3.	648.3
4.	803.6
5.	576.8
S.E./mean	= 83.54 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 50 (113).

Site :- Oilseed Sub-Stn., Gummar.

Type :- 'M'.

Object :—To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 5.11.1950. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e)—. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 10.14" approx. (x) 2 and 3.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N : $N_0=0$ and $N_1=25$ lb./ac.(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=32$ lb./ac.N as A/S applied on 20.1.1951 while P_2O_5 as Super applied at sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 1/99th of an ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1081 lb./ac.
 (ii) 144.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	967	1104	1036
N_1	1130	1123	1127
Mean	1049	1114	1081

S.E. of any marginal mean = 51.1 lb./ac.

S.E. of body of table = 72.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 51(142).

Site :- Oilseed Sub-Stn., Gummar.

Type :- 'M'.

Object :—To study the effect of method of application of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 7.11.1951. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e)—. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 11.49" approx. (x) N.A.

2. TREATMENTS :

- Control (no manure).
- 25 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super—broadcast.
- 25 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super—depth application.
- 25 lb./ac. of N as A/S—broadcast.
- 25 lb./ac. of P_2O_5 as Super—broadcast.
- 25 lb./ac. of P_2O_5 as Super—depth application.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/146th of an ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good, condition very poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 577.2 lb./ac.

(ii) 67.10 lb./ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	375.4
2.	788.4
3.	746.2
4.	750.9
5.	384.8
6.	417.7
S.E./mean	=35.55 lb./ac.

Crop :- Wheat (*Rabi*).

Site :- Oilseed Sub- Stn., Gummar.

Ref :- Pb. 51(143).

Type :- 'M'.

Object:—To study the effect of application of lime on yield of Wheat when applied alone and with A/S and C/N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 19.11.1951. (iv) (a) N.A. (b) Broadcast. (c) 35 sr./ac. (d) and (e)—. (v) Nil. (vi) C—250 (medium). (vii) Rainfed. (viii) N.A. (ix) 11.49° approx. (x) 2.5.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.

(2) 3 applications of N : $N_0=0$, $N_1=20$ lb./ac. of N as A/S and $N_2=20$ lb./ac. of N as C/N.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/138th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 533.0 lb./ac.

(ii) 100.45 lb./ac.

(iii) N effect is significant while others are not significant.

(iv) Av. yield of grain in lb./ac.

	L_0	L_1	Mean
N_0	417.0	474.6	445.8
N_1	585.5	563.3	574.4
N_2	603.3	554.5	578.9
Mean	535.3	530.8	533.0

S.E. of marginal mean of N
S.E. of marginal mean of L
S.E. of body of table

=35.51 lb./ac.
=29.00 lb./ac.
=50.22 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Oilseed Sub-Stn., Gummar.

Ref :- Pb. 53(188).
Type :- 'M'.

Object :- To study the effect of time and method of application of N on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 6.12.1952. (iv) (a) N.A. (b) Broadcast. (c) 38 sr./ac. (d) and (e) —. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 14.00" approx. (x) 7.5.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as A/S by broadcast at sowing.
3. 20 lb./ac. of N as A/S in contact with seed.
4. 20 lb./ac. of N as A/S applied 1" below seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 6.05' x 60'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 686.1 lb./ac.
- (ii) 89.54 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	688.5
2.	659.6
3.	659.6
4.	736.7
S.E./mean	= 44.77 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Oilseed Sub-Stn., Gummar.

Ref :- Pb. 52(268).
Type :- 'M'.

Object :- To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 6/7.12.1952. (iv) (a) N.A. (b) Sown in lines. (c) 5 chhks/plot. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 19.13" approx. (x) 7.5.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as A/S by broadcast.
3. 20 lb./ac. of P₂O₅ as Super by broadcast.
4. 20 lb./ac. of P₂O₅ as Super by *kera*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 32' x 11'—3". (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 818.3 lb./ac.
 (ii) 168.92 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatments	Av. yield
1.	722.4
2.	819.2
3.	815.5
4.	916.0
S.E./mean	=84.46 lb./ac.

Crop :- Wheat (*Rabi*)

Site :- Oilseed Sub-Stn., Gummar.

Ref :- Pb. 53(269).

Type :- 'M'.

Object :- To study the effect of time of application of A/S on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Line sown. (c) 35 sr./ac. (d) 9' row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 19.13" approx. (x) 24.4.1954.

2. TREATMENTS :

1. Control.
2. 20 lb./ac. of N as A/S applied below seed on 13.11.1953.
3. 20 lb./ac. of N as A/S applied in contact with seed on 13.11.1953.
4. 20 lb./ac. of N as A/S broadcast before sowing on 13.11.1953.
5. 20 lb./ac. of N as A/S broadcast with 1st shower of rain on 28.12.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) $33' \times 16\frac{1}{2}' = 1/30$ th ac. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination normal, condition and stand good. No lodging. (ii) Nil. (iii) Grain yield and straw weight. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 749.8 lb./ac.
 (ii) 104.61 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	619.7
2.	833.1
3.	786.9
4.	735.4
5.	774.0
S.E./mean	=52.31 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Oilseed Sub-Stn., Gummar.

Ref :- Pb. 53(270).
Type :- 'M'.

Object :—To study the effect of method of application of A/S with and without Super.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Sown in lines. (c) 38 sr./ac. (d) 9" row and row. (c) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 19.13" approx. (x) 24.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 doses of N : $N_0=0$, $N_1=30$ lb./ac. of N as A/S applied below seed and $N_2=30$ lb./ac. of as C/N drilled below seed.

(2) 2 doses of P_2O_5 as Super : $P_0=0$ and $P_1=30$ lb./ac.
A/S applied on 13.11.1953 and Super before sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) $33' \times 16\frac{1}{2}' = 1/10$ th of an ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil (iii) Grain yield and straw weight. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 850.4 lb./ac.
(ii) 138.96 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	699.4	871.7	946.3	839.1
P_1	812.6	941.1	879.4	877.7
Mean	756.0	906.4	912.9	858.4

S.E. of marginal mean of P = 40.11 lb./ac.
S.E. of marginal mean of N = 49.13 lb./ac.
S.E. of body of table = 69.48 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Oilseed Sub-Stn. Gummar.

Ref :- Pb. 53(271).
Type :- 'M'.

Object :—To study the effect of application of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Sown in line. (c) 38 sr./ac. (d) 2" row to row. (c) N.A. (vi) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 12.13". (x) 23.4.1954.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N of A/S.
3. 20 lb./ac. of P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) $33' \times 16\frac{1}{2}'$ (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 734.6 lb./ac.

(ii) 71.73 lb./ac.

(iii) Treatments are significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	637.7
2.	812.6
3.	753.4
S.E./mean	= 35.87 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 53(272).

Site :- Oilseed Sub-Stn., Gummar.

Type :- 'M'.

Object :—To study the effect of application of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 13.11.1953. (iv) (a) N.A. (b) Broadcast. (c) 35-38 sr./ac. (d) and (e) —. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 19.13" approx. (x) 24.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_1=0$ and $P_2=20$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 1/100th of an ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield and straw weight. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 805.2 lb./ac.

(ii) 111.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	845.4	777.9	811.7
N_1	739.3	858.2	798.8
Mean	792.4	818.1	805.2

S.E. of any marginal mean = 39.30 lb./ac.

S.E. of body of table = 55.58 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(7).

Site :- Barley Res. Farm, Gurgaon.

Type :- 'M'.

Object :- To assess the value of N and P₂O₅ fertilizers in relation to grain yield.

1. BASAL CONDITIONS :

- (i) (a) Not followed. (b) *Guara* (green manure). (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.11.1952.
 (iv) (a) 1 *hindustan* plough and 4 *desi* ploughs. (b) Pore. (c) 1 md./ac. (d) 6' row to row. (e) —.
 (v) *Guara* green manure. (vi) C-281 (early). (vii) Irrigated. (viii) 2 hoeings and one weeding. (x) 2.27".
 (x) 6.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=25 and N₂=50 lb./ac.(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=25 and P₂=50 lb./ac.

Super drilled along with seed and A/S added at the time of first irrigation.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 9. (b) N A. (iii) 6. (iv) (a) 12½'×66'. (b) 11'×64'. (v) Two rows on each side of the plot kept as border. (vi) Yes.

4. GENERAL :

- (i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, no. of grains/ear and grain weight.
 (iv) (a) 1952—54. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1525 lb./ac.

(ii) 132.4 lb./ac.

(iii) N effect is highly significant. P effect is significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1191	1285	1386	1287
N ₁	1501	1557	1600	1553
N ₂	1724	1701	1781	1735
Mean	1472	1514	1558	1525

S.E. of marginal mean = 31.2 lb./ac.

S.E. of body of table = 54.1 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(6).

Site :- Barley Res. Farm, Gurgaon.

Type :- 'M'.

Object :- To assess the value of N and P₂O₅ fertilizers in relation to grain yield.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Cotton-Fallow-*Mung*-Barley-*Guara* (G.M.) or Fallow. (b) *Guara* (green manure). (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.11.1953. (iv) (a) One *hindustan* ploughing and 4 *desi* ploughing. (b) Pore. (c) 1 md./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-281 (early). (vii) Irrigated. (viii) One weeding and 2 hoeings. (ix) 6.55". (x) 15.4.1954.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N as A/S : N₀=0, N₁=25 and N₂=50 lb./ac.(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=25 and P₂=50 lb./ac.

Super drilled along with seed and A/S added at the time of first irrigation.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/99th ac. (b) 40.3' x 9'. (v) One row on each side of the plot kept as border. (vi) Yes.

4. GENERAL :

(i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, no. of grains per ear and grain weight. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Heavy showers of rain were received on 5th, 20th and 21st Feb. 1954. (vii) Nil.

5. RESULTS :

- (i) 935.6 lb./ac.
 (ii) 143.44 lb./ac.
 (iii) Only N effect is significant while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	894.9	763.7	933.4	864.0
N ₁	864.0	968.1	891.0	907.7
N ₂	1064.6	1056.9	983.6	1035.0
Mean	941.2	929.6	936.0	935.6

S.E. for any marginal mean = 41.41 lb./ac.
 S.E. of body of table = 71.72 lb./ac.

Crop :- Wheat.

Site :- Barley Res. Farm, Gurgaon.

Ref :- Pb. 53(7).

Type :- 'M'.

Object :- To compare the effect of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (G.M.) (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.11.1953. (iv) (a) One *hindustan hal* ploughing and 4 *desi hal* ploughing. (b) Pore. (c) 1 md./ac. (d) N.A. (e) —. (v) Nil. (vi) C—281 (early). (vii) Irrigated. (viii) One weeding and two hoeings. (ix) 6.55". (x) 15.4.1954.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 2 doses of N : N₁=15 and N₂=30 lb./ac.

(2) 2 sources of N : S₁=A/S and S₂=C/N.

Fertilizers applied at the time of first irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 1/99th ac. (b) 40½' x 9'. (v) One row on each side of the plot kept as border. (vi) Yes.

4. GENERAL :

(i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, no. of grain per ear and grain weight. (iv) (a) 1953 to 1954. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) Heavy showers of rain were received on 5th, 20th and 21st February. (vii) Nil.

5. RESULTS :

- (i) 2153 lb./ac.
 (ii) 266.7 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	Control = 2029 lb./ac.		Mean
	S ₁	S ₂	
M ₁	2206	1902	2054
M ₂	2299	2330	2315
Mean	2253	2116	2285

S.E. for any marginal mean = 94.3 lb./ac.
S.E. of body of table = 133.4 lb./ac.

Crop :-Wheat.

Ref :-Pb. 48 (5).

Site :-Govt. Agri. Stn., Gurdaspur.

Type :-'M'.

Object :-To study the effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1948. (iv) (a) 1 *raja* plough, 3 *desi* plough and 4 *sohaga*. (b) N.A. (c) 40 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) Nil. (ix) 5.33". (x) 29.4.1949.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure).

(1) 2 levels of N : N₁=15 and N₂=30 lb./ac.

(2) 2 sources of N : S₁=A/S and S₂=Ammo. Phos.

Fertilizers were broadcast at sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'×61.5'. (b) 16.5'×52.8'. (v) At out 4.5' along length and 1.5' along breadth. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory in Ammo. Phos. plots and poor in control and N₁S₁ plots. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948-1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1207 lb./ac.

(ii) 156.7 lb./ac.

(iii) Main effects of S, control vs. others and interaction N×S are highly significant while N effect is not significant.

(iv) Av. yield of grain in lb./ac.

	Control = 989 lb./ac.		Mean
	N ₁	N ₂	
S ₁	1183	1030	1107
S ₂	1280	1555	1418
Mean	1232	1293	1263

S.E. for any marginal mean

=45.2 lb./ac.

S.E. of body of table

=64.0 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 49(12).
Type :- 'M'.

Object :- To study the effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (Fodder). (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 1.11.1949. (iv) (a) 1 *hindustan* 4 *desi* plough and 5 *Sohaga* (b) N.A. (c) 1 md./ac. (d) 6" row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) Nil. (ix) 7.52". (x) 9.5.1950.

2. TREATMENTS:

All combinations of (1) and (2) + a control (no manure).

(1) 2 levels of N : $N_1=15$ and $N_2=30$ lb./ac.

(2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo. Phos.$

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 16'×72'. (b) 14½'×59.4'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1948 lb./ac.

(ii) 211.4 lb./ac.

(iii) Only S effect is significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

	Control = 1828 lb./ac.		
	N_1	N_2	Mean
S_1	1869	1905	1887
S_2	2028	2113	2071
Mean	1949	2009	1979

S.E. of any marginal mean = 61.0 lb./ac.

S'E. of body of table = 86.3 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 50(10).
Type :- 'M'.

Object :- To study effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28.10.1950. (iv) (a) 5 ploughings, 7 *sohaga* and 1 roller. (b) and (c) N.A. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding and hoeing. (ix) 4.86". (x) 23.4.1951.

2. TREATMENTS:

All combinations of (1) and (2) + a control (no manure).

(1) 2 levels of N : $N_1=15$ and $N_2=30$ lb./ac.

(2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo. Phos.$

A/S and Ammo. Phos. broadcast on 28.10.1950.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'×60.0'. (b) 16.5'×52.8'. (v) N.A. (vi) Yes.

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4. GENERAL :

(i) Germination satisfactory but growth below normal due to persistent drought. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 620.6 lb./ac.
 (ii) 90.45 lb./ac.
 (iii) N and control vs. others effects are highly significant while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	Control =428.0 lb./ac		Mean
	N ₁	N ₂	
S ₁	610.7	702.3	656.5
S ₂	597.3	764.5	680.9
Mean	604.0	733.4	668.7

S.E. of any marginal mean =26.11 lb./ac.
 S.E. of body of table =36.93 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 51 (78).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the effect of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.11.1951. (iv) (a) 1 *raja* and 5 *Desi hal*, 6 *sohaga* and 1 roller. (b) N.A. (c) One md./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 8.54". (x) 28.4.1952.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 2 levels of N : N₁=15 and N₂=30 lb./ac.

(2) 2 sources of N : S₁=A/S and S₂=Ammo. Phos.

A/S and Ammo. Phos. applied on 4.11.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'×60'. (b) 16.5'×52.8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1028 lb./ac.
 (ii) 126.9 lb./ac.
 (iii) Only effects due to N and control vs. others are highly significant.
 (iv) Av. yield of grain in lb./ac.

	Control =891 lb./ac.		Mean
	N ₁	N ₂	
S ₁	955	1141	1048
S ₂	1012	1139	1076
Mean	984	1140	1062

S.E. of any marginal mean =36.6 lb./ac.
 S.E. of body of table =51.8 lb./ac.

Crop :- Wheat.
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 48(7).
Type :- 'M'.

Object :- To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 13.11.1948. (iv) (a) One *raja* and 2 *desi* ploughings, 1 *panjdanta* and 3 plankings. (b) N.A. (c) 3 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 5.33". (x) 28,29.4.1949.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 sources of N : $S_1=A/S$, $S_2=Amm. Phos.$ and $S_3=F.Y.M.$

(2) 2 levels of N : $N_1=25$ and $N_2=50$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 72'-7" × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Experiments after this year tried with different varieties using split-plot design and are under category 'MV'. Ref. numbers are Pb. 49 (11), Pb. 50(12) and Pb. 51(74).

5. RESULTS :

(i) 2241 lb./ac.

(ii) 166.8 lb./ac.

(iii) S effect is highly significant while N effect and interaction $S \times N$ is significant.

(iv) Av. yield of grain in lb./ac.

	Control = 2207 lb./ac.			
	S_1	S_2	S_3	Mean
N_1	2358	2249	2384	2330
N_2	2104	1849	2535	2163
Mean	2231	2049	2459	2246

S.E. of marginal means of S = 59.0 lb./ac.

S.E. of marginal means of N = 48.2 lb./ac.

S.E. of body of table = 83.4 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 49(6).
Type :- 'M'.

Object :- To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 18.11.1949. (iv) (a) 2 *raja* and 4 *desi* plough, 4 *sohaga* and 1 roller. (b) N.A. (c) One md./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 7.52". (x) 8.5.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control (no manure).

(1) 3 sources of N : $S_1=A/S$, $S_2=Ammo. Phos.$ and $S_3=F.Y.M.$

(2) 2 levels of N : $N_1=25$ and $N_2=50$ lb./ac.

A/S and Ammo. Phos. broadcast on 1.2.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $15' \times 78'-2''$. (b) $13\frac{1}{2}' \times 73'-4''$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2222 lb./ac.
 (ii) 268.4 lb./ac.
 (iii) S effect is highly significant while control vs. others effect is significant.
 (iv) Av. yield of grain in lb./ac.

Control = 1867 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	2110	2529	1904	2181
N ₂	2500	2769	1878	2382
Mean	2305	2649	1891	2282

S.E. of marginal mean of S = 94.9 lb./ac.
 S.E. of marginal mean of N = 77.5 lb./ac.
 S.E. of body of table = 134.2 lb./ac.

Crop :- Wheat (*Rabi*).

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 50(11).

Type :- 'M'.

Object :- To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9.11.1950. (iv) (a) 1 *raja* and 4 *desi* plough and 6 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 4.86". (x) 17.5.1951.

2. TREATMENTS :

All combinations of (1) × (2) + a control (no manure).

(1) 3 sources of N : S₁ = A/S, S₂ = Ammo. Phos. and S₃ = F.Y.M.

(2) 2 levels of N : N₁ = 25 and N₂ = 50 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $15' \times 81'-2''$. (b) $13'-6'' \times 73'-4''$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory and normal growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1889 lb./ac.
 (ii) 309.4 lb./ac.
 (iii) S effect is highly significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=1782 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	2071	2041	1578	1897
N ₂	2039	2205	1505	1916
Mean	2055	2123	1542	1907

S.E. of marginal mean of N = 109.4 lb./ac.
 S.E. of marginal mean of S = 89.3 lb./ac.
 S.E. of body of table = 154.7 lb./ac.

Crop :- Wheat (*Rabi*).

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 51 (76).

Type :- 'M'.

Object :- To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Nil. (iii) 24.10.1951. (iv) (a) 1 *raja* and 5 *desi* hal, 6 *sohaga* and 1 roller. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 8.54". (x) 22.4.1952.

2. TREATMENTS ;

All combinations of (1) and (2) + a control (no manure).

(1) 3 sources of N : S₁=A/S, S₂=Ammo. Phos. and S₃=F.Y.M.(2) 2 levels of N : N₁=25 and N₂=50 lb./ac.

F.Y.M. applied on 24.10.1951 while A/S and Ammo. Phos. on 21.12.1951.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 15'×80'. (b) 13'-6"×73'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination below normal. / Severe lodging in plots of A/S and Ammo. Phos. (ii) Nil. (iii) Grain yield. (iv) (a) 1948-1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Low yield in plots other than the control might be due to some damage to crop due to lodging.

5. RESULTS :

(i) 1368 lb./ac.

(ii) 257.5 lb./ac.

(iii) Only S effect is significant.

(iv) Av. yield of grain in lb./ac.

Control=1583 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	1205	1260	1474	1313
N ₂	1271	1188	1592	1350
Mean	1238	1224	1533	1332

S.E. of marginal mean of S = 91.1 lb./ac.
 S.E. of marginal mean of N = 74.3 lb./ac.
 S.E. of body of table = 128.8 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 49(10).
Type :- 'M'.

Object :—To compare the effect of combined doses of N and Super on Wheat yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3.11.1949. (iv) (a) 1 *hindustan*, 5 *desi* ploughing and 5 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 7.52". (x) 7.5.1950.

2. TREATMENTS :

1. Control.
 2. Ammo. Phos. at 25 lb./ac. of N + 31½ lb./ac. of P₂O₅ as Super.
 3. Ammo. Phos. at 50 lb./ac. of N + 62½ lb./ac. of P₂O₅ as Super.
 4. A/S at 25 lb./ac. of N + 31½ lb./ac. of P₂O₅ as Super.
 5. A/S at 50 lb./ac. of N + 62½ lb./ac. of P₂O₅ as Super.
- A/S and Ammo. Phos. broadcast on 22.1.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 16'-6" × 44'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1761 lb./ac.
- (ii) 168.0 lb./ac.
- (iii) Treatments differ highly significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1365
2.	1705
3.	1992
4.	1751
5.	1990
S.E./mean	= 68.6 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 51(73).
Type :- 'M'.

Object :—To find out the best combination of N & P₂O₅ for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 15.11.1951. (iv) (a) 1 *raja*, 5 *desi* and 6 *sohaga* (b) N.A. (c) 1 md./ac. (d) 6" rows to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 8.54". (x) 19.21.4.1952.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 levels of N : N₀=0, N₁=25, N₂=50 and N₃=75 lb./ac.
- (2) 3 levels of P₂O₅ : P₀=0, P₁=25 and P₂=50 lb./ac.

P₂O₅ as Super applied on 15.11.1951 and N as A/S on 20.12.1951.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 12' × 66'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1257 lb./ac. :
(ii) 203.8 lb./ac.
(iii) N effect is highly significant while P effect is significant.
(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	808	836	920	855
N ₁	1096	1289	1272	1219
N ₂	1289	1583	1427	1433
N ₃	1489	1578	1496	1521
Mean	1171	1322	1279	1257

S.E. of marginal mean of P = 41.6 lb./ac.
S.E. of marginal mean of N = 48.0 lb./ac.
S.E. of body of table = 83.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref:-Pb. 51(72).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of graded dose of A/S and Ammo. Phos. on yield of Wheat.

1. BASAL CONDITIONS

- (i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.11.1951. (iv) (a) 1 *raja*, 4 *desi* plough, 1 *roller* and 5 *sohaga*. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Field was green manured by sannhemp and in addition 10 C.L. of F.Y.M. added as basal dose. (vi) C-518. (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 8.54". (x) 27.4.1952.

2. TREATMENTS :

All combinations of (1) × (2) + a control (no manure).

(1) 3 levels of N : N₁=25, N₂=50 and N₃=75 lb./ac.(2) 2 sources of N : S₁=A/S and S₂=Ammo. Phos.

Half A/S and Ammo. Phos. applied on 20.12.1951 while other half applied on 6.2.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 15' × 66'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination and growth satisfactory. Lodging in plots treated with A/S and Ammo. Phos. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Low yield in plots other than control might be due to lodging in these plots.

5. RESULTS:

- (i) 1416 lb./ac.
(ii) 122.4 lb./ac.
(iii) N and control vs. others effects are highly significant while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control=1580 lb./ac.

	N ₁	N ₂	N ₃	Mean
S ₁	1475	1446	1348	1423
S ₂	1499	1343	1223	1355
Mean	1487	1395	1286	1389

S.E. of marginal mean of S = 28.9 lb./ac.
S.E. of marginal mean of N = 35.3 lb./ac.
S.E. of body of table = 50.0 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 50(13).
Type :- 'M'.

Object :- To compare the effect of *guara* green manure on the following Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 1.12.1950. (iv) (a) 1 *raja*, 5 *desi* plough, 6 *sohaga* and 1 roller. (b) N.A. (c) 35 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-228 (medium). (vii) Irrigated. (viii) One weeding. (ix) 4.86". (x) 17.5.1951.

2. TREATMENTS :

1. Control (no *guara* sown).
2. *Guara* crop fed to bullocks.
3. *Guara* buried as G.M.
4. *Guara* matured for seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 24' x 75'-7.5" (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1067 lb./ac.
- (ii) 107.4 lb./ac.
- (iii) Treatments differ highly significantly.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	852
2.	1017
3.	1482
4.	916
S.E./mean	=53.7 lb./ac.

Crop :-Wheat (*Rabi*).
Site :-Govt. Agri. Stn., Gurdaspur.

Ref :-Pb. 51 (77).
Type :-'M'.

Object .—To compare the effect of *guara* green manure on the following Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1951. (iv) (a) 1 *raja*, 5 *desi* plough, 6 *sohaga* and 1 roller. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.54". (x) 24.4.1952.

2. TREATMENTS :

1. Control (no *guara* sown).
2. *Guara* crop fed to bullocks.
3. *Guara* buried as G.M.
4. *Guara* matured for seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 24' x 75'-7.5". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1951. (b) [No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1604 lb./ac.
 (ii) 264.8 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1618
2.	1790
3.	1590
4.	1418
S.E./mean	=132.4 lb./ac.

Crop :-Wheat.

Ref :-Pb. 52 (42).

Site :-Govt. Agri. Stn., Gurdaspur.

Type :-'M'.

Object :—To study the effect of placement of fertilizers on yield of Wheat crop under *Barani* condition.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.11.1952. (iv) (a) 8 ploughing and 10 *sohaga* (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) 2 hoeings and weedings. (ix) 4.82". (x) 20.4.1953.

2. TREATMENTS :

- Control.
- 10 lb./ac. of N as A/S applied 1" deep below seed by drilling.
- 10 lb./ac. of N as A/S applied with seed by broadcast.
- 10 lb./ac. of N as A/S broadcast before sowing.
- 10 lb./ac. of N as A/S broadcast with 1st shower of rain.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5'×60'. (b) 16.5'×52.8' (v) 1½' along breadth and 3.6' along length. (vi) Yes.

4. GENERAL :

- (i) Growth and germination satisfactory. No information about lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) First shower of rain on 18.1.1953.

5. RESULTS :

- (i) 1465 lb./ac.
 (ii) 100.7 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1342
2.	1537
3.	1504
4.	1477
5.	1464
S.E./mean	=41.1 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52 (43).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the effect of placement of fertilizer on yield of Wheat crop under irrigated condition.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 20.11.1952. (iv) (a) 8 ploughings and 11 *sohaga* (b) N.A. (c) 34 sr./ac. (d) and (e) N.A. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 4.82". (x) 23.4.1953.

2. TREATMENTS:

1. Control (no manure).
2. 20 lb./ac. of N as A/S applied 1" below the seed by drilling.
3. 20 lb./ac. of N as A/S applied in contact with seed.
4. 20 lb./ac. of N as A/S broadcast before sowing.
5. 20 lb./ac. of N as A/S broadcast with first irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 19.5' × 60'. (b) 16.5' × 52.8'. (v) 1½' on breadth side and 3.6' on length side. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS

- (i) 1944 lb./ac.
 (ii) 173.4 lb./ac.
 (iii) Treatments are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1710
2.	2214
3.	1889
4.	2056
5.	1850
S.E./mean	= 70.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52 (44).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the effects of different methods of application of A/S on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 21.11.1952. (iv) (a) 8 ploughings and 12 *sohaga*. (b) N.A. (c) 34 sr./ac. (d) 9" row to row. (e) N.A. (v) Sannhemp buried on 5.8.1952 for green manuring the field. (vi) C-250 (medium). (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 4.82". (x) 24.4.1953.

2. TREATMENTS :

1. Control.
2. 30 lb./ac. of N in contact with seed.
3. 30 lb./ac. of N broadcast with 1st irrigation.
4. 15 lb./ac. of N in contact with seed and 15 lb./ac. of N near ear formation.
5. 20 lb./ac. of N in contact with seed.
6. 20 lb./ac. of N broadcast with 1st irrigation.
7. 10 lb./ac. of N in contact with seed + 10 lb./ac. of N near ear formation. N as A/S applied on 21.11.1952, 19.12.1952 and 26.2.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 15'×60'. (b) 12'×55'. (v) 1½' and 2½' on length and breadth side of each plot. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory growth normal plots with 30 lb./ac. of N heavily lodged and plots with 20 lb./ac. of N very slightly lodged, date of lodging N.A. (ii) Damage by rat in almost all plots was observed, the wheat grain was heavily attacked by new burnt disease; control measures taken N.A. (iii) Grain yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 2048 lb./ac.
 (ii) 270.3 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1970
2.	1974
3.	1796
4.	2168
5.	2225
6.	2025
7.	2179
S.E./mean	= 110.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(45).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the effect of A/S and Super alone and in combination on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 14.11.1952. (iv) (a) 7 ploughings and 10 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) 9" row to row. (e) N.A. (v) 8 C.L. of F.Y.M. as basal dressing by broadcast one month before sowing. (vi) C-250.(medium). (vii) Irrigated. (viii) One hoeing and weeding. (ix) 4 82". (x) 21.4.1953.

2. TREATMENTS :

- Control (no manure).
 - 30 lb./ac. of P₂O₅ as Super.
 - 15 lb./ac. of P₂O₅ as Super+15 lb./ac. of N as A/S.
 - 30 lb./ac. of N as A/S.
- A/S broadcast on 14.11.1952 and Super drilled on 14.11.1952 before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 81'×18'. (b) 72'-7"×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1968 lb./ac.
 (ii) 171.0 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1791
2.	2009
3.	2036
4.	2034
S.E./mean	= 69.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(47).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of lateral placement of A/S compared to broadcast on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 8 C.L. of F.Y.M. on 16.6.1952 by broadcast. (ii) (a) Heavy loam. (b) N.A. (iii) 13.11.1952. (iv) (a) 7 ploughings and 10 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 2 hoeings and 3 weedings. (ix) 4.82". (x) 28.4.1953.

2. TREATMENTS:

All combinations of (1)×(2)+a Control (no manure).

(1) 3 levels of N as A/S : $N_1=20$, $N_2=30$ and $N_3=40$ lb./ac.(2) 2 methods of application of N : $M_1=Drilling$ and $M_2=Broadcast$.

Treatments applied on 19.12.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 10'×89'. (b) 9'×73'-4". (v) N.A. (vi) Yes

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1959 lb./ac.

(ii) 238.4 lb./ac.

(i) Effects due to 'control vs others' is highly significant.

(iv) Av. yield of grain in lb./ac.

Control=1451 lb./ac.

	N_1	N_2	N_3	Mean
M_1	1997	2102	2206	2102
M_2	1865	1997	2097	1986
Mean	1931	2050	2152	2044

S.E. of marginal means of N =68.8 lb./ac.
 S.E. of marginal means of M =56.2 lb./ac.
 S.E. of body of table =97.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(65).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the residual effect of A/S and Super (applied to maize) on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 2.11.1953. (iv) (a) 4 ploughings and 8 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) 1 hoeing. (ix) 10.33". (x) 23.4.1954.

2. TREATMENTS :

1. Control (no manure).

2. 60 lb./ac. of N as A/S applied to maize crop.

3. 60 lb./ac. of P_2O_5 as Super applied to maize crop.

Super applied on 22.6.1953 and A/S on 31.7.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 81'×24'. (b) 75.6'×24'. (v) On one length side nearly 2.6' left on the other length side 3' left. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS

- (i) 1178 lb./ac.
 (ii) 118.8 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1088
2.	1372
3.	1075
S.E./mean	= 48.5 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 53(67).

Type :- 'M'.

Object :- To study the effect of time and method of application of N on Wheat.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat (b) Maize. (c) 2 md. and 32 sr. of A/S by *kera* on 23.6.1953 and 2 md., 8 srs. of A/S on 31.7.1953 by *kera*. (ii) (a) Loam. (b) N.A. (iii) 4.11.1953. (iv) (a) 5 *desi* plough, 10 *sohaga* and 2 horse hoe. (b) By *kera*. (c) 32 sr./ac. (d) 9" row to row. (e) —. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.33". (x) 26.4.1954.

2. TREATMENTS :

- Control (no manure).
- 30 lb./ac. of N as A/S broadcast with first irrigation.
- 30 lb./ac. of N as A/S applied in contact with seed by *kera* on 4.11.1953.
- 30 lb./ac. of N as A/S applied half as in treatment 3 and half near ear formation by broadcast.
- 30 lb./ac. of N as A/S applied half as in treatment 2 and half near ear formation by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 81'×12'. (b) 55'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1627 lb./ac.
 (ii) 144.9 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1438
2.	1635
3.	1682
4.	1740
5.	1638
S.E./mean	= 59.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(68).

Site :- Govt. Agr. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the best method of application of 'A/S' and its effect on germination, growth and yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.11.1953. (iv) (a) 6 *desi* ploughings and 1 *sohaga*. (b) N.A. (c) 9" row to row. (d) 32 sr./ac. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeing *cum* weeding. (ix) 10.33". (x) 20.4.1954.

2. TREATMENTS :

1. Control (no manure).
2. 30 lb./ac. of N drilled below the seed row with *pore* by mixing seed and fertilizer before application.
3. 30 lb./ac. of N drilled below the seed row followed by sowing the seed with *kera*.
4. 30 lb./ac. of N applied in contact with seed by dropping the fertilizer in furrows by *kera* followed by seeding.
5. 30 lb./ac. of N as A/S broadcast before sowing.
6. 30 lb./ac. of N as A/S broadcast with first irrigation on 6.12.1953.
N as A/S applied on 4.11.1953 in plots with 2 to 5 treatments.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 81' × 12'. (b) 55' × 12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth normal.. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil (vi) and (vii) Nil.

5. RESULTS :

- (i) 1566 lb./ac.
- (ii) 279.9 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1551
2.	1245
3.	1590
4.	1723
5.	1665
6.	1621
S.E./mean	=114.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(78).

Site :- Govt. Agri, Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the best method of application of N on yield of *Barani* Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 2.11.1953. (iv) (a) 6 ploughings and 8 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Unirrigated. (viii) 3 hoeings, one roller taking and one weeding. (ix) 10.33". (x) 17.4.1954.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N drilled below seed with *pore*.
3. 20 lb./ac. of N drilled below seed row followed by sowing.
4. 20 lb./ac. of N applied in contact with seed.
5. 20 lb./ac. of N broadcast before sowing.
6. 20 lb./ac. of N broadcast with first rain shower.
First shower is on 10.11.1953. N as A/S applied on 11.11.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) $15' \times 48' = 5.8''$ (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield and straw weight. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1439 lb./ac.
 (ii) 97.9 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1300
2.	1182
3.	1628
4.	1530
5.	1552
6.	1441
S.E./mean	= 40.0 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 53(81).

Type :- 'M'.

Object :- To determine the suitability of blood meal as manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 21.11.1953. (iv) (a) 6 ploughings and 10 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) 9' row to row. (e) N.A. (v) Sannhemp was buried in the field by ploughing it for green manuring the field on 5.8.1953. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeing and weedings. (ix) 10.33". (x) 26.4.1954 and 1.5.1954.

2. TREATMENTS :

1. Control.
 2. 40 lb./ac. of N as blood meal.
 3. 40 lb./ac. of N as F.Y.M.
 4. 40 lb./ac. of N as A/S.
 Treatments broadcast on 21.11.1953 before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) $13.5' \times 53' - 9.3''$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1264 lb./ac.
 (ii) 103.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	539
2.	1445
3.	1336
4.	1715
S.E./mean	= 42.0 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(82).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the effect of application of B.M., B.M. compost and Super alone and in combination with A/S on the yield of irrigated Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 24.11.1953. (iv) (a) 6 ploughings & 10 *sohaga*. (b) N.A. (c) 35 sr./ac. (d) 9" row to row. (e) N.A. (v) Sannhemp buried in the soil for green manuring on 5.8.1953. (vi) C—250 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 25, 30.4.1954.

2. TREATMENTS :

1. Control (no manure).
 2. 25 lb./ac. of P_2O_5 as B.M.
 3. 25 lb./ac. of P_2O_5 as B.M. compost.
 4. 25 lb./ac. of P_2O_5 as B.M.+25 lb./ac. of P_2O_5 as B.M. compost.
 5. 25 lb./ac. of P_2O_5 as B.M.+25 lb./ac. of N as A/S
 6. 25 lb./ac. of P_2O_5 as B.M. compost+25 lb./ac. of N as A/S.
 7. 25 lb./ac. of P_2O_5 as Super.
 8. 25 lb./ac. of P_2O_5 as Super+25 lb./ac. of N as A/S
- Treatments broadcast on 24.11.1953 before sowing.

3. DESIGN ;

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 55'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1584 lb./ac.
 (ii) 109.9 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1402
2.	1426
3.	1504
4.	1521
5.	1757
6.	1667
7.	1542
8.	1854
S.E./mean	=54.9 lb./ac.

Crop :-Wheat.

Ref :-Pb. 53 (79).

Site :-Govt. Agri. Stn., Gurdaspur.

Type :-'M'.

Object :—To study the effect of different doses of N and P_2O_5 , alone and in combination on yield of unirrigated Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) 10 lb./ac. of N as A/S applied to previous wheat crop. (ii) (a) Loam. (b) N.A. (iii) 1.11.1953. (iv) (a) 6 ploughings, 8 *sohaga* and 1 horse hoe. (b) N.A. (c) 32 sr./ac. (d) 9" from row to row. (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) One hoeing and one rake running to break crust on 11.11.1953. (ix) 10.33". (x) 22.4.1954.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N: $N_0=0$, $N_1=15$ and $N_2=30$ lb./ac.

(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=15$ and $P_2=30$ lb./ac.

N as A/S broadcast on 11.11.1953 and P_2O_5 as Super broadcast on 1.11.1953.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) $12' \times 55'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1489 lb./ac.

(ii) 163.2 lb./ac.

(iii) N and P effects are highly significant while interaction NP is not significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1195	1339	1414	1316
N_1	1455	1564	1532	1517
N_2	1400	1776	1727	1634
Mean	1350	1560	1558	1489

S.E. of any marginal mean = 38.5 lb./ac.

S.E. of body of table = 66.6 lb./ac.

Crop :-Wheat.

Site :-Govt. Agri. Stn., Gurdaspur.

Ref :-Pb. 52 (46).

Type :-'M'.

Object :-To determine a suitable combination of N and P_2O_5 for irrigated Wheat crop.

1. BASAL CONDITIONS ;

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.11.1952. (iv) (a) 7 ploughings & 10 *sohaga*. (b) N.A. (c) 1 md. 4 sr./ac. (d) 9th row to row. (e) N.A. (v) Sannhemp burried on 8.8.1952 as G.M. (vi) C—591 (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 4.82rd. (x) 3.5.1953.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N as A/S: $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.

(2) 3 levels of P_2O_5 as Super: $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

Fertilizers broadcast on 20.11.1952.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $13.5' \times 70'$. (b) $12' \times 66'$. (v) 9th bund on breadth sides, 1' bund on length sides and 1' border left on length sides. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Slight lodging. (ii) Attack by field rats on all fields and loose smut attack ; eradication of affected plants on 14.3.1953. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2143 lb./ac.
(ii) 141.9 lb./ac.
(iii) Only P effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1998	2199	2235	2144
N ₁	2105	2283	2164	2184
N ₂	1988	2164	2153	2102
Mean	2030	2215	2184	2143

S.E. of any marginal mean =33.4 lb./ac.
S.E. of body of table =57.9 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53 (80).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'

Object :- To determine a suitable combination of N and P₂O₅ for irrigated Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9.11.1953. (iv) (a) 4 ploughings, 7 *Sohaga* and 1 horse hoe. (b) N.A. (c) 32 sr./ac. (d) 9" row and row. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 10.33". (x) 25.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=25 and N₂=50 lb./ac.(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=25 and P₂=50 lb./ac.

Super broadcast on 9.11.1953 while A/S broadcast on 26.12.1953.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 13.5'×53'-9.3". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1460 lb./ac.
(ii) 195.5 lb./ac.
(iii) N effect is significant while others are not significant.
(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1128	1107	1261	1165
N ₁	1381	1568	1628	1526
N ₂	1653	1686	1728	1689
Mean	1387	1454	1539	1460

S.E. of any marginal mean =56.4 lb./ac.
S.E. of body of table =97.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 51 (31).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To find the best dose of A/S and Super for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1951. (iv) (a) 15 *Desi* plough, 6 *sohaga*, 2 bar harrow, 1 roller and 1 horse hoe. (b) N.A. (c) 37½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One bar harrow. (ix) 2.80". (x) 4.4.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=25$, $N_2=50$ and $N_3=75$ lb./ac.(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.N as A/S applied on 11.12.1951 and P_2O_5 as Super applied at sowing time.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 74'×12'. (b) 69'-2"×10'-6". (v) N.A. (vi) Yes.

4. GENERAL :

Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1952. (b) No. (c) N.A. (ii) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1977 lb./ac.
 (ii) 224.0 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1763	1632	1695	1697
N_1	1941	2046	1995	1994
N_2	1878	2137	2110	2042
N_3	2122	2188	2218	2176
Mean	1926	2001	2005	1977

S.E. of marginal mean of N = 52.8 lb./ac.
 S.E. of marginal mean of P = 45.7 lb./ac.
 S.E. of body of table = 91.5 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52 (108).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To find the best dose of A/S and Super for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 19.11.1952. (iv) (a) 1 *Raja* plough, 1 *desi* plough, 1 horse hoe. (b) N.A. (c) 36½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86". (x) 12.4.1953.

2. TREATMENTS

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=25$, $N_2=50$ and $N_3=75$ lb./ac.(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

N as A/S given in full dose on 24.2.1953 to N_1 and N_2 plots while to the N_3 plot A/S at 50 lb./ac. of N applied on 24.12.1952 and 25 lb./ac. of N applied on 28.1.1953 by broadcast. Super at sowing time by broadcast.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 74'×12' (b) 69'-2"×10'-6". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1952. (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2407 lb./ac.
 (ii) 281.3 lb./ac.
 (iii) Only N effect is significantly different.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	2213	2204	2337	2251
N ₁	2247	2430	2592	2423
N ₂	2326	2454	2526	2435
N ₃	2396	2627	2528	2517
Mean	2296	2429	2496	2407

S.E. of marginal mean of N = 66.3 lb./ac.
 S.E. of marginal mean of P = 57.4 lb./ac.
 S.E. of body of table = 114.8 lb./ac.

Crop :-Wheat.
 Site :-Govt. Agri. Stn., Hansi.

Ref.:-Pb. 49 (82).
 Type :-'M'.

Object :-To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 14.11.1949. (iv) (a) 2 *Raja* plough, 9 *desi* plough, 1 horse hoe and 8 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) C-591 (medium); (vii) Irrigated. (viii) Nil. (ix) 2.15". (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S at 1st irrigation.
3. 25 lb./ac. of N as A/S in February.
4. 50 lb./ac. of N as A/S at 1st irrigation.
5. 50 lb./ac. of N as A/S in February.
6. 25 lb./ac. of N as Ammo. Phos. at 1st Irrigation.
7. 25 lb./ac. of N as Ammo. Phos. in February.
8. 50 lb./ac. of N as Ammo. Phos. at 1st Irrigation.
9. 50 lb./ac. of N as Ammo. Phos. in February.
10. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as A/S in February.
11. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as Ammo. Phos. in February.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 9'×80'-8". (b) 9'×80'-8". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—continued with changes in treatments from 1953. (b) No. (c) Nil (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS

- (i) 2518 lb./ac.
 (ii) 275.6 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatments	Av. yield
1.	1844	7.	2685
2.	2397	8.	2509
3.	2247	9.	2893
4.	2613	10.	2577
5.	2922	11.	2700
6.	2310		
	S.E./mean	137.8 lb./ac.	

Crop :-Wheat.

Ref :-Pb. 50 (83).

Site :-Govt. Agri. Stn., Hansi.

Type :-'M'.

Object :—To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS :

- (i) (i) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 11.11.1950. (iv) (a) and b) N.A. (c) 1 sr.-3 *chk.*/plot. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.20". (x) 23.4.1951.

2. TREATMENTS :

- Control (no manure).
- 25 lb./ac. of N as A/S at 1st Irrigation.
- 25 lb./ac. of N as A/S in February.
- 50 lb./ac. of N as A/S at 1st irrigation.
- 50 lb./ac. of N as A/S in February.
- 25 lb./ac. of N as Ammo. Phos. at 1st irrigation.
- 25 lb./ac. of N as Ammo. Phos. in February.
- 50 lb./ac. of N as Ammo. Phos. at 1st irrigation.
- 50 lb./ac. of N as Ammo. Phos. in February.
- 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as A/S in February.
- 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as Ammo. Phos. in February.

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 12'×107'. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—continued with changes in treatments from 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

- (i) 2425 lb./ac.
 (ii) 154.2 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2255	7.	2353
2.	2361	8.	2543
3.	2438	9.	2497
4.	2623	10.	2312
5.	2425	11.	2528
6.	2345		
	S.E./mean	77.1 lb./ac.	

Crop :- Wheat.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 51(26).
Type :- 'M'.

Object :- To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Nil. (iii) 26.10.1951. (iv) (a) 1 *raja* plough, 3 *dest* plough, 2 horse hoe and 4 *sohaga*. (b) N.A. (c) 37½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.80°. (x) 14.4.1952.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S at 1st irrigation.
3. 25 lb./ac. of N as A/S applied on 1.2.1952.
4. 50 lb./ac. of N as A/S at 1st irrigation.
5. 50 lb./ac. of N as A/S applied on 1.2.1952.
6. 25 lb./ac. of N as Ammo. Phos. at 1st irrigation.
7. 25 lb./ac. of N as Ammo. Phos. applied on 1.2.1952.
8. 50 lb./ac. of N as Ammo. Phos. at 1st irrigation.
9. 50 lb./ac. of N as Ammo. Phos. applied on 1.2.1952.
10. 25 lb./ac. of N as F.Y.M. before sowing + 25 lb./ac. of N as A/S applied on 1.2.1952.
11. 25 lb./ac. as F.Y.M. before sowing + 25 lb./ac. of N as Ammo. Phos. applied on 1.2.1952. F.Y.M. applied on 26.10.1951. before sowing and treatments 2,4,6,8 applied on 23.11.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 9' × 80'-8". (b) 9' × 80'-8". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—continued with changes in treatments from 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2827 lb./ac.
- (ii) 240.5 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2677	7.	2874
2.	2615	8.	2779
3.	2893	9.	3090
4.	2665	10.	3074
5.	2854	11.	2958
6.	2621		

S.E./mean = 120.3 lb./ac.

Crop :- Wheat.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 52(104).
Type :- 'M'.

Object :- To study the response of Wheat to A/S and Ammo. Phos.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) 25 lb./ac. of N as F.Y.M. (ii) (a) Heavy loam. (b) N.A. (iii) 10.11.1952. (iv) (a) 13 *dest* plough, 9 *sohaga* and 2 horse hoe. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86°. (x) 10.4.1953.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S at 1st irrigation on 29.12.1952.
3. 25 lb./ac. of N as A/S applied on 22.2.1953.
4. 50 lb./ac. of N as A/S at 1st irrigation on 29.12.1952.
5. 50 lb./ac. of N as A/S applied on 22.2.1953.
6. 25 lb./ac. of N as Ammo. Phos. at 1st irrigation on 29.12.1952.
7. 25 lb./ac. of N as Ammo. Phos. applied on 22.2.1953.
8. 50 lb./ac. of N as Ammo. Phos. at 1st irrigation on 29.12.1952.
9. 50 lb./ac. of N as Ammo. Phos. applied on 22.2.1953.
10. 25 lb./ac. of N as F.Y.M. before sowing+25 lb./ac. of N as A/S applied on 22.2.1953.
11. 25 lb./ac. of N as F.Y.M. before sowing+25 lb./ac. of N as Ammo. Phos. applied on 22.2.1953. F.Y.M. broadcast on 10.11.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) $10\frac{1}{2}' \times 95'$. (b) $9' \times 80\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—contd. with changes in treatments in 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2547 lb./ac.
 (ii) 230.1 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	2353	7.	2611
2.	2480	8.	2590
3.	2490	9.	2688
4.	2532	10.	2690
5.	2480	11.	2573
6.	2530		

S.E./mean = 115.0 lb./ac.

Crop :-Wheat.

Ref. :-Pb. 53 (120).

Site :-Govt. Agri. Stn., Hansi.

Type :-'M'.

Object :-To study the response of Wheat to C/N and A/S.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Guar*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953. (iv) (a) 1 *raja*, 6 *dēsi* plough, 6 *sohaga* and 2 roller. (b) 26 st./ac. (c) N.A. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (iv) 4.50°. (x) 20.4.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3) and a control (no manure).

(1) 2 levels of N: $N_1=25$ and $N_2=40$ lb./ac.

(2) 2 sources of N: $S_1=A/S$ and $S_2=C/N$.

(3) 2 times of application: $T_1=At$ first irrigation on 20.12.1953 and $T_2=At$ flowering stage on 14.2.1954 by broadcast.

3. DESIGN :

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) $96' \times 15'$. (b) $82.5' \times 12'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—continued, [treatments from this year changed. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2290 lb./ac.
 (ii) 298.4 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	Control =2138 lb./ac.		Mean	T ₁	T ₂
	S ₁	S ₂			
N ₁	2329	2389	2359	2303	2416
N ₂	2264	2252	2258	2169	2348
Mean	2296	2321	2309	2236	2382
T ₁	2286	2186	2236		
T ₂	2307	2456	2382		

S.E. of any marginal mean
 S.E. of body of any table
 S.E. of control mean

= 74.6 lb./ac.
 =105.5 lb./ac.
 =149.2 lb./ac.

Crop :-Wheat.

Site :-Govt. Agri. Stn., Hansi.

Ref :-Pb. 50 (84).

Type :-'M'.

Object :-To study the effect of graded doses of A/S and Super.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 30.11.1950. (iv) (a) 1 *raja* plough, 3 *desi* plough and 2 *sohaga*. (b) Sown by *kera*. (c) 35 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.20". (x) 24.4.1951.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ : P₀=0, P₁=25 and P₂=50 lb./ac.

N as A/S applied on 10.1.1951 while P₂O₅ as Super applied on 30.11.1950.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) 12'×64'. (b) 12'×60'-6". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging, (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1089 lb./ac.
 (ii) 180.9 lb./ac.
 (iii) Effect of P alone is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	905	816	825	849
N ₁	1091	1061	1173	1108
N ₂	1228	1348	1350	1309
Mean	1075	1075	1116	1089

S.E. of any marginal mean =46.7 lb./ac.
 S.E. of body of table =80.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48 (53).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :—To study the effect of town compost and farm compost on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28, 29.10.1948. (iv) (a) and (b) N.A. (c) 10.5 *chk*/plot. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 0.71". (x) 25.4.1949.

2. TREATMENTS :

1. Control (no manure).
2. T.C. at 10 ton./ac. applied before sowing.
3. Farm compost at 10 ton./ac. applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 12'×74'-4". (b) 12'×60'-6". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1590 lb./ac.
- (ii) 250.7 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1713
2.	1494
3.	1562
S.E./mean	= 88.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49 (74).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :—To study the effect of town compost and farm compost on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 13.12.1949. (iv) (a) 5 plough, 7 *sohaga* and 1 roller. (b) N.A. (c) 36 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.15". (x) 29.4.1950.

2. TREATMENTS :

1. Control (no manure).
 2. Town compost 10 ton/ac.
 3. Farm compost 10 ton/ac.
- Manuring done on 4.11.1949 and 26.11.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10'-6"×69.1'. (b) 10'-6"×69.1'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2012 lb./ac.
 (ii) 171.7 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1799
2.	2074
3.	2164
S.E./mean	= 171.65 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 51(32).

Type :- 'M'.

Object :- To study the residual effect of *guara* on Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 30.11.1951. (iv) (a) 3 *desi* plough and 4 *sobaga*. (b) N.A. (c) 37½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.80°. (x) 17.4.1952.

2. TREATMENTS :

Previous crop :-

- Fallow (control).
- Guara* for fodder.
- Guara* for green manuring.
- Guara* for seed.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 24'×64'. (b) 24'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v)(a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 684 lb./ac.
 (ii) 165.2 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	679
2.	559
3.	883
4.	616
S.E./mean	= 67.5 lb./ac.

Crop :- Wheat.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 52(98).

Type :- 'M'.

Object :- To study the residual effect of *guara* on yield of Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow and *guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3.12.1952. (iv) (a) 1 *raja* plough, 5 *desi* plough, 6 *sohaga* and 1 roller. (b) N.A. (c) 33½ sr./ac. (d) and (e) N.A. (v) *Guara* green manured on 28.8.1952. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86°. (x) 15.4.1953.

2. TREATMENTS :

Previous crops:-

1. Fallow.
2. *Guara* for fodder.
3. *Guara* for seed.
4. *Guara* green manured.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 66'×11'. (b) 66'×11'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) (a) Fair except in plots with treatments 2 and 3. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 660 lb./ac.
 (ii) 69.7 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	789
2.	483
3.	369
4.	1000
S.E./mean	= 28.5 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(54).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'

Object :- To study the effect of heaped manure and trenched manure on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 11.11.1948. (iv) (a) to (c) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 0.71". (x) 23.4.1949.

2. TREATMENTS :

1. Control (no manure).
2. Heaped manure (well rotten) 7 md.-34 sr./gross plot.
3. Trenched manure (partly rotten) 12 md.-10 sr./gross plot.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 74'×16'-6". (b) 60'×16'-5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1533 lb./ac.
 (ii) 248.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1431
2.	1570
3.	1599
S.E./mean	= 87.9 lb./ac.

Crop :- Wheat
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 53(24).
Type :- 'M'.

Object :—To study the effect of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) 75 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953.
(iv) (a) 1 *raja* plough, 9 *desi* plough, 7 *sohaga* and 1 roller. (b) N.A. (c) 37 sr./ac. (d) and (e) N.A.
(v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.50". (x) 21.4.1954.

2. TREATMENTS :

1. Control.
2. 40 lb./ac. of N as A/S.
3. 40 lb./ac. of N as C/N.
A/S and C/N applied on 10.1.1954 with watering.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 96'×45'-4". (b) 85'-7"×42'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-continuing. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 2169 lb./ac.
(ii) 118.3 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1824
2.	2419
3.	2264
S.E./mean	=59.1 lb /ac.

Crop :- Wheat (*Rabi*).
Site :- Govt. Seed Farm, Jacch.

Ref :- Pb. 52(190).
Type :- 'M'.

Object :—To study the time of application of different kinds of manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 10.12.1952. (iv) (a) N.A. (b) Sown in lines. (c) 30 sr./ac. (d) 8" row to row. (e) —. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 8.48". (x) 28.5.1953.

2. TREATMENTS :

All combinations of (1) and (2).
(1) 2 levels of N : $N_0=0$ and $N_1=25$ lb./ac.
(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=25$ lb./ac.
N as A/S applied when crop was one month old while P_2O_5 as super applied before sowing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 632.6 lb./ac.
(ii) 45.13 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	Mean
P ₀	524.6	617.1	570.9
P ₁	966.9	421.7	694.3
Mean	745.8	519.4	632.6

S.E. of any marginal mean = 18.42 lb./ac.
S.E. of body of table = 26.05 lb./ac.

Crop :- Wheat.
Site :- Govt. Seed Farm, Jacch.

Ref :- Pb. 52(191).
Type :- 'M'.

Object :—To study the effect of fertilizer on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 8.12.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) N.A. (ix) 8.48°. (x) 28.5.1953.

2. TREATMENTS :

- Control (no manure).
- 20 lb./ac. of N as A/S broadcast at sowing time.
- 20 lb./ac. of P₂O₅ as Super broadcast at sowing time.
- 20 lb./ac. of P₂O₅ as Super drilled immediately after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 9' × 121'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 543.9 lb./ac.
(ii) 65.26 lb./ac.
(iii) Treatments are highly significantly different.
Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	362.6
2.	578.6
3.	540.0
4.	694.3
S.E./mean	= 32.63 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 52 (189).

Site :- Govt. Seed Farm, Jacch.

Type :- 'M'.

Object :- To study the effect of placement of A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 1.12.1952. (iv) (a) N.A. (b) Sown in lines. (c) 30 sr./ac. (d) 8" row to row. (e) —. (v) Nil. (vi) C—250 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 8.48". (x) 26.5.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as A/S broadcast at sowing.
3. 20 lb./ac. of N as A/S applied by *pore* and seed sown by *kera*.
4. 20 lb./ac. of N as A/S applied in contact with seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×136'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 517.5 lb./ac.
 (ii) 65.45 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield*
1.	369
2.	612
3.	567
4.	522
S.E./mean	=32.73 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48 (20).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find a suitable manure for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.11.1948. (iv) (a) 1 *raja* and *desi* ploughings. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) One hoeing, weeding and topping. (ix) 6.29". (x) 17.4.1949.

2. TREATMENTS :

1. Control (no manure).
 2. 75 lb./ac. of N as A/S.
 3. 75 lb./ac. of N as A/N.
 4. 75 lb./ac. of N as Ammo. Phos.
 5. 94.5 lb./ac. of P₂O₅ as Super.
- Manures applied on 15.12.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 12'×52'. (b) 12'×45'-4½". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. Lodging occurred in plots with treatment Nos. 2, 3 and 4. (ii) Heavy rust attack in plots with treatment Nos. 2, 3 and 4. Control measures taken N.A. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 2375 lb./ac.

(ii) 203.3 lb./ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1942
2.	2691
3.	2530
4.	2662
5.	2049
S.E./mean	=90.9 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(12).

Site :- Jullundur Agri.Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of manures applied to previous Maize crop on the following Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) As per treatments. (iii) 4.11.1948. (iv) (a) 3 *desi* plough. (b) to (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.29°. (x) 15.4.1949.

2. TREATMENTS :

1. Control (no manure).

2. 100 lb./ac. of N as F.Y.M.

3. 150 lb./ac. of N as F.Y.M.

4. 100 lb./ac. of N as A/S.

5. 150 lb./ac. of N as A/S.

6. 50 lb./ac. of N as F.Y.M.+50 lb./ac. of N as A/S.

7. 75 lb./ac. of N as F.Y.M.+75 lb./ac. of N as A/S.

Manure applied to the previous crop maize on 8.8.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 7'×47'. (b) 7'×43'-24". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Slight lodging in patches in plots with treatment 4. (ii) Nil. (iii) Straw and grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi, and (vii) Nil.

5. RESULTS :

(i) 2935 lb./ac.

(ii) 252.6 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2950
2.	2672
3.	2851
4.	2984
5.	3151
6.	2901
7.	3033
S.E./mean	=103.1 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 49(26).
Type :- 'M'.

Object :- To study the effect of *guara* green manured with and without P_2O_5 on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 3.11.1949. (iv) (a) One *raja* ploughing, 4 *desi* ploughing, 6 *sohaga* and 1 roller. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 6.14". (x) 24.4.1950.

2. TREATMENTS :

1. *Guara* green manured.
2. *Guara* green manured + 10 lb./ac. of P_2O_5 as Super.
Super applied on 3.11.1949.

3. DESIGN :

(i) Paired plots. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 43'-7" x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2142 lb./ac.
(ii) 292.4 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2144
2.	2140
S.E./mean	= 119.4 lb./ac.

Crop :- Wheat (*Rabi*).
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 49 (18).
Type :- 'M'.

Object :- To study the residual effect of manures applied to previous crop and application of A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra*. (c) As per main-plot treatments. (ii) (a) Loam. (b) N.A. (iii) 30.11.1949
(iv) (a) 4 *Desi* ploughings and 4 *sohaga* (b) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated.
(viii) One weeding. (ix) 6.14". (x) 30.4.1950.

2. TREATMENTS :

Main-plot treatments :

3 levels of N (applied to previous crop *Bajra*) : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

Sub-plot treatments :

3 levels of N' : $N'_0=0$, $N'_1=25$ and $N'_2=50$ lb./ac.

N' as A/S applied in sub-plots on 30.12.1949.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A.
(b) 6.75' x 89.63'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Slight lodging took place in plots in which 50 lb./ac. of N was applied to current wheat crop. (ii) Nil.
(iii) Grain and straw yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1811 lb./ac.
 (ii) (a) 38.3 lb./ac.
 (b) 168.7 lb./ac.
 (iii) Both N and N' effects are highly significant while their interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	N ₀ '	N ₁ '	N ₂ '	Mean
N ₀	663	1716	2530	1636
N ₁	802	1932	2783	1839
N ₂	1136	2018	2719	1958
Mean	867	1889	2677	1811

S.E. of difference of two

1. N marginal means = 18.1 lb./ac.
 2. N' marginal means = 79.5 lb./ac.
 3. N' means at the same level of N = 137.7 lb./ac.
 4. N means at the same level of N' = 113.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49 (28).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different doses of A/S on Wheat yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.11.1949. (iv) (a) 5 *Desi hal*, 5 *sohaga* and 1 horse hoe. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding and hoeing. (ix) 6.14". (x) N.A.

2. TREATMENTS :

1. Control (no manure).
 2. 25 lb./ac. of N as A/S.
 3. 50 lb./ac. of N as A/S.
 4. 75 lb./ac. of N as A/S.
 'A/S' broadcast on 15.12.1949.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 24. (iv) (a) and (b) 1/48th ac. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) No lodging. (ii) N.A. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2865 lb./ac.
 (ii) 246.4 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2685
2.	2876
3.	2925
4.	2973
S.E./mean	= 50.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(14).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different manures on the yield of Wheat under unirrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 22.10.1948. (iv) (a) 1 *raja*, 6 *desi* plough, 1 horse hoe and 5 *sohaga*. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing and weeding. (ix) 11.4.1949.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 3 sources of N : S_1 =F.Y.M., S_2 =A/S and S_3 =Ammono. Phos.(2) 2 levels of N : N_1 =16 and N_2 =25 lb./ac.

A/S and Ammono. Phos. applied on 22.12.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 89.63'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth satisfactory. No lodging. (ii) Slight attack of yellow rust. (iii) Grain and straw yield. (iv) (a) 1948-1949. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1290 lb./ac.

(ii) 142.3 lb./ac.

(iii) Only S effect and "control vs., others" effect are highly significant.

(iv) Av. yield of grain in lb./ac.

Control=1051 lb./ac.

	N_1	N_2	Mean
S_1	1228	1180	1204
S_2	1414	1412	1413
S_3	1365	1378	1372
	1336	1323	1330

S.E. of marginal mean of S =41.1 lb./ac.

S.E. of marginal mean of N =33.5 lb./ac.

S.E. of body of table =58.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49(16).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different manures on yield of Wheat under unirrigated conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (green manure). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 29.10.1949. (iv) (a) 5 *desi hal*, 4 *sohaga* and 1 horse hoe. (b) to (e) N.A. (v) *Guara* green manure buried on 26,27.8.1949. (vi) C-591 (medium). (vii) Unirrigated. (viii) One hoeing and weeding. (ix) 6.14th. (x) 22,23.4.1950.

2. TREATMENTS

All combinations of (1) and (2) + a control

(1) 3 sources of N : S_1 =F.Y.M., S_2 =A/S and S_3 =Ammono. Phos.(2) 2 levels of N : N_1 =16 and N_2 =25 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 79.2'×13.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good but growth below normal due to the absence of adequate rains. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948-1949. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1163 lb./ac.
 (ii) 153.8 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

Control=1185 lb./ac.

	N ₁	N ₂	Mean
S ₁	1276	1110	1193
S ₂	1212	1056	1134
S ₃	1248	1054	1151
Mean	1245	1073	1159

S.E. of marginal mean of S =44.4 lb./ac.
 S.E. of marginal mean of N =36.3 lb./ac.
 S.E. of body of table =62.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(16).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Water melon. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.11.1948.
 (iv) (a) 1 *raja*, 4 *desi*, 3 horse hoe, 6 *sohaga* and 1 *bar harrow*. (b) N.A. (c) 32 sr./ac. (d) N.A. (e) N.A.
 (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 6.29". (x) 15 to 17.4.1949.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 sources of N : S₁=F.Y.M., S₂=A/S and S₃=Ammo. Phos.

(2) 2 levels of N : N₁=25 and N₂=40 lb./ac.

F.Y.M. applied before sowing on 10.10.1948 and A/S and Ammo. Phos. applied on 22.12.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 15'×44'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Slight attack of yellow rust. (iii) Grain and straw yield. (iv) (a) 1948 to 1950.
 (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1887 lb./ac.
(ii) 402.1 lb./ac.
(iii) Effects of S and "control vs. others" are highly significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control = 1383 lb./ac.			
	N ₁	N ₂	Mean
S ₁	1484	1452	1468
S ₂	1935	2305	2120
S ₃	2230	2420	2325
Mean	1883	2059	1971

S.E. of marginal mean of S = 116.1 lb./ac.
S.E. of marginal mean of N = 94.8 lb./ac.
S.E. of body of table = 164.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49(17).

Site :- Jullundur Agri. Stn., Jullundur,

Type :- 'M'.

Object :- To find the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Bajra* and Maize. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 14.11.1949.
(iv) (a) 1 *raja* ploughing, 3 *desi* ploughings and 4 *sohaga*. (b) to (e) N.A. (v) 13 C.L. of F.Y.M. from 2 to 9.9.1949. (vi) C-519 (medium). (vii) Irrigated. (viii) One hoeing-cum-weeding. (ix) 6.14". (x) 30.4.1950 and 1.5.1950.

2. TREATMENTS :

All combinations of (1) and (2) + a control (no manure).

(1) 3 sources of N : S₁=F.Y.M., S₂=A/S and S₃=Ammono. Phos.

(2) 2 doses of N : N₁=25 lb./ac. and N₂=40 lb./ac.

F.Y.M. applied on 13.11.1949. Other fertilizers broadcast on 23.12.1949.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 2. (iv) (a) and (b) 15' x 44'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination good; growth good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1950. (b) Nil. (c) Nil. (v) (a) Nil. (b) -. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2571 lb./ac.
(ii) 347.9 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control = 2715 lb./ac.			
	N ₁	N ₂	Mean
S ₁	3089	2520	2804
S ₂	2003	2342	2172
S ₃	2681	2647	2664
Mean	2591	2503	2547

S.E. for marginal mean of S = 173.9 lb./ac.
S.E. for marginal mean of N = 142.0 lb./ac.
S.E. of body of table = 246.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49(29).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize-Wheat. (b) Maize. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.11.1949. (iv) (a) 5 *desi hal*, 4 *sohaga* 1 roller and 1 horse hoe. (b) N.A. (c) 30 sr./ac, (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Hoeing and weeding. (ix) 6.14". (x) 28.4.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 sources of N : S_1 =F.Y.M., S_2 =A/S and S_3 =Ammono. Phos.(2) 2 levels of N : N_1 =25 and N_2 =40 lb./ac.

F.Y.M. applied on 13.11.1949 while A/S and Ammono. Phos. on 23.12.1949

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) 1/65th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948—1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 2272 lb./ac.

(ii) 135.5 lb./ac.

(iii) Effect of S, N and "control vs. others" are highly significant.

(iv) Av. yield of grain in lb./ac.

Control=1783 lb./ac.			
	N_1	N_2	Mean
S_1	2084	2123	2103
S_2	2337	2259	2433
S_3	2329	2719	2524
Mean	2250	2457	2353

S.E. of marginal mean of S =55.3 lb./ac.

S.E. of marginal mean of N =45.2 lb./ac.

S.E. of body of table =78.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 50(17).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find the effect of different manures on yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Onion. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1950. (iv) (a) 1 *raja*, 7 *desi hal*, 1 horsehoe and 4 *sohaga*. (b) No. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 5.19". (x) 26, 29, 30.4.1951.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 4 sources of N : S_1 =F.Y.M., S_2 =A/S, S_3 =Ammono. Phos. and S_4 =G.N.C.(2) 2 levels of N : N_1 =25 and N_2 =40 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 10.5'×46.09'. (b) 9.0'×46.09'. (v) One furrow left on each side of length. (vi) Yes.

4. GENERAL :

(i) Germination good ; growth normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948—1950. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) Nil. (vi) Nil.

5. RESULTS :

- (i) 1560 lb./ac.
 (ii) 326.2 lb./ac.
 (iii) "Control vs others", S and N effects are highly significant.
 (iv) Av. yield of grain in lb./ac.

Control=916 lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean.
N ₁	891	1674	1820	1654	1510
N ₂	1035	2052	2077	1921	1771
Mean	963	1863	1948	1788	1641

S.E. of marginal mean of S = 94.0 lb./ac.
 S.E. of marginal mean of N = 66.6 lb./ac.
 S.E. of body of table = 133.2 lb./ac.

Crop :-Wheat (*Rabi*).

Site :-Jullundur Agri. Stn., Jullundur.

Ref :-Pb. 49 (31).

Type :-'M'.

Object :-To study the effect of application of compost and F.Y.M. on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 12.12.1949.
 (iv) (a) 1 *raja* ploughing, 3 *desi* ploughing, 6 *sohaga*, and 1 horse hoe. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) C-228 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 6.14". (x) 4.5.1950.

2. TREATMENTS :

- Control (no manure).
 - 10 ton/ac. of F.Y.M.
 - 10 ton/ac. of compost.
- Manures applied on 10.12.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 104'×19.5'. (b) 100'-10"×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield (iv) (a) 1949—1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1120 lb./ac.
 (ii) 47.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	876
2.	1025
3.	1460
S.E./mean	=19.2 lb./ac.

Crop :-Wheat.
Site :-Jullundur Agri. Stn., Jullundur.

Ref :-Pb. 50 (14).
Type :-'M'.

Object :—To study the effect of compost and F.Y.M. on the yield of Wheat against no manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1950.
(iv) (a) 1 *raja* plough, 6 *desi hal*, 2 horse hoe and 5 *sohaga*, (b) N.A. (c) 1 md./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding-cum-hoeing. (ix) 5.19". (x) 25.4.1951.

2. TREATMENTS :

1. Control (no manure).
2. 10 ton/ac. of F.Y.M.
3. 10 ton/ac. of Compost.
F.Y.M and Compost applied on 4, 6.11.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 12'×100.83'. (b) 10.5'×100.83'. (v) One row on each side of length. (vi) Yes.

4. GENERAL:

(i) Germination good. Growth satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949—1950. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 873 lb./ac.
(ii) 109.8 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	690
2.	877
3.	1053
S.E./mean	=44.8 lb./ac.

Crop :- Wheat.
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52(65).
Type :- 'M'.

Object :—To find the best dose of N obtained from A/S for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize. (b) Maize. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 22,23.11.1952. (iv) (a) 7 ploughing and 5 *sohaga* (b) N.A. (c) 30 sr./ac. (d) 8" row to row. (e) N.A. (v) Nil. (vi) C-518 (medium). (vii) Irrigated. (viii) One weeding and one hoeing. (ix) 2.8". (x) 22.4.1953.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 50 lb /ac. of N as A/S.
4. 75 lb./ac. of N as A/S.
Half A/S applied at sowing and half on 6.1.1953.

3. DESIGN

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 16. (iv) (a) 110'×10'. (b) 90.75'×8.75'. (v) N.A. (vi) Yes.

4. GENERAL

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2381 lb./ac.
 (ii) 308.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1987
2.	2358
3.	2600
4.	2580
S.E./mean	= 77.0 lb./ac.

Crop :- Wheat (*Rabi*).

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 49(30).

Type :- 'M'.

Object :- To study the effect of different sources of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Chari* (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 24.11.1949.
 (iv) (a) 4 *desi* plough, 3 *sohaga*, 1 horse hoe and 1 roller. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (v) Nil.
 (vi) C-591. (medium). (vii) Irrigated. (viii) Nil. (x) 6.14". (y) 27.4.1950.

2. TREATMENTS :

All combinations of (1) and (2) + a Control

(1) 3 doses of N : $N_1=100$ md./ac. of F.Y.M., $N_2=100$ md./ac. of Compost and $N_3=2$ md./ac. of A/S.

(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=10$ lb./ac.

F.Y.M. and Compost applied on 23.11.1949, A/S on 23.12.1949 while P_2O_5 as Super broadcast on 23.12.1949.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 32' × 10'-6" (b) 30'.2" × 9'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949—52. (b) No. (c) Nil.
 (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS

- (i) 891 lb./ac.
 (ii) 67.6 lb./ac.
 (iii) N and 'control vs. others' effects are highly significant while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

Control = 443.5 lb./ac.

	N_1	N_2	N_3	Mean
P_0	1748	526	598	957
P_1	1841	511	567	973
Mean	1794	518	582	965

S.E. of marginal mean of P = 23.9 lb./ac.
 S.E. of marginal mean of N = 19.5 lb./ac.
 S.E. of body of table = 33.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 50(18).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different sources of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 3.11.1950. (iv) (a) 1 *raja*, 5 *desi hal* and 6 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 5.19". (x) 30.4.1951 and 1.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 3 doses of N: N_1 =F.Y.M. at 100 md./ac., N_2 =Compost at 100 md./ac. and N_3 =A/S at 2 md./ac.(2) 2 levels of P_2O_5 : N_0 =0 lb./ac. and N_1 =10 lb./ac. of P_2O_5 .F.Y.M. and Compost applied on 29.11.1950, A/S on 11.1.1951 while P_2O_5 as Super applied on 27.11.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12'×45.36'. (b) 10.5'×45.36'. (v) One furrow left on each side of plot as non-experimental area. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Locust attack (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 646.5 lb./ac.

(ii) 110.50 lb./ac.

(iii) N and "control vs. others" effects are highly significant.

(iv) Av. yield of grain in lb./ac.

	Control =305.6 lb./ac.			
	N_1	N_2	N_3	Mean
P_0	382	408	1196	662
P_1	438	403	1393	745
Mean	410	406	1294	703

S.E. of marginal mean of N =39.1 lb./ac.

S.E. of marginal means of P =31.9 lb./ac.

S.E. of body of table =55.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 91(94).

Site :- Jullundur. Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different sources of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Bajra*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 18.11.1951. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.85" (x) 17.4.1952.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 doses of N: N_1 =F.Y.M. at 100 md./ac., N_2 =Compost at 100 md./ac. and N_3 =A/S at 2 md./ac.(2) 2 levels of P_2O_5 : P_0 =0 and P_1 =10 lb./ac. P_2O_5 as Super, F.Y.M. and Compost applied on 18.11.1951 before sowing while A/S applied on 20.12.51. at 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 54'×12'.75'. (b) 48.40'×11.25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good ; growth fair in F.Y.M. plots and good in A/S plots. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 962.5 lb./ac.

(ii) 64.34 lb./ac.

(iii) N and "control vs. others" effects are highly significant while interaction NP is significant.

(iv) Av. yield of grain in lb./ac.

	Control =573.4 lb./ac.			Mean.
	N ₁	N ₂	N ₃	
P ₀	614.6	630.0	1830.9	1025.2
P ₁	684.0	690.4	1713.9	1029.4
Mean	649.3	660.2	1772.4	1027.3

S.E. of marginal mean of N =22.75 lb./ac.

S.E. of marginal mean of P =18.57 lb./ac.

S.E. of body of table =32.17 lb./ac.

Crop :- Wheat.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52(55).

Type :- 'M'.

Object :-To find the best source of N in presence and absence of Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat-Fallow-Wheat. (b) Fallow. (c) Nil. (ii) (a) loam. (b) Refer soil analysis, Jullundur. (iii) 12.11.1952. (iv) (a) 1 *raja* plough, 6 *desi hal*, 4 *sohaga* and 1 horse hoe. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 2.8". (x) 2.5.1953.

2. TREATMENTS :

All combinations of (1) and (2)+a Control.

(1) 3 doses of N : N₁=F.Y.M. at 100 md./ac., N₂=Compost at 100 md./ac. and N₃=A/S at 2 md./ac.

(2) 2 levels of P₂O₅ : P₀=0 and P₁=10 lb./ac.

F.Y.M., Compost and P₂O₅ as Super were broadcast on 12.11.1952 while A/S [was broadcast on 22.12.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 44.44'×14'. (b) 38.88'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) --. (vi) and (vii) Nil.

5. RESULTS :

(i) 2188 lb./ac.

(ii) 261.4 lb./ac.

(iii) N effect is highly significant.

(vi) Av. yield of grain in lb./ac.

Control = 1945 lb./ac.

	N ₁	N ₂	N ₃	Mean
P ₀	2073	2310	2488	2290
P ₁	1986	2037	2477	2167
Mean	2029	2174	2482	2228

S.E. of marginal mean of N = 92.4 lb./ac.
 S.E. of marginal mean of P = 75.5 lb./ac.
 S.E. of body of table = 130.7 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 51(93).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the residual effect of manuring to previous crop and application of A/S to current Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.11.1951. (iv) (a) One *raja*, 5 *desi hal* and 6 *sohaga*. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-518 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.85". (x) 22.4.1952.

2. TREATMENTS :

Main-plot treatments :

4 levels of N : N₀=0, N₁=50, N₂=100 and N₃=150 lb./ac. of N as A/S.
 A/S applied to previous maize crop.

Sub-plot treatments :-

4 levels of N : M₀=0, M₁=25, M₂=50 and M₃=75 lb./ac. of N as A/S.
 A/S applied to present wheat crop on 15.12.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Sub-plot : 110' × 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good, Growth satisfactory. No lodging. (ii) Nil. (iii) Only grain yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1507 lb./ac.

(ii) (a) 135.9 lb./ac.

(b) 180.3 lb./ac.

(iii) N effect is highly significant. Interaction N × M is significant.

(iv) Av. yield of grain in lb./ac.

	M ₀	M ₁	M ₂	M ₃	Mean
N ₀	1087	1550	1774	1611	1506
N ₁	1139	1494	1703	1590	1482
N ₂	1237	1721	1843	1324	1531
N ₃	1446	1661	1617	1306	1508
Mean	1227	1607	1734	1458	1507

S E. of difference of two

1. N marginal means = 48.1 lb./ac.
2. M marginal means = 63.8 lb./ac.
3. M means at the same level of N = 127.5 lb./ac.
4. N means at the same level of M = 120.4 lb./ac.

Crop :- Wheat.

Ref :- Pb. 50 (19).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of *Guara* green manure on soil fertility and on succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.12.1950. (iv) (a) 1 *raja*, 4 *desi hal* and 6 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-228 (late). (vii) Irrigated. (viii) One weeding. (ix) 5.19". (x) 27.4.1951.

2. TREATMENTS :

1. Wheat sown after fallow. (control)
2. Wheat sown after *guara* green manured.
3. Wheat sown after *guara* for fodder.
4. Wheat sown after *guara* kept for seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 100.83'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good ; growth normal. No lodging. (ii) Attack by locust. (iii) Grain and straw yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1064 lb./ac.
 (ii) 204.3 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	887
2.	1082
3.	1203
4.	1083
S.E./mean	= 83.4 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 51 (84).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of *Guara* green manure on soil fertility and on succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.12.1951. (iv) (a) One *raja* plough, 4 *desi hal* and 7 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-228 (late). (vii) Irrigated. (viii) One weeding. (ix) 11.63". (x) 28.4.1952.

2. TREATMENTS :

1. Wheat sown after fallow (control).
2. Wheat sown after *guara* green manured.
3. Wheat sown after *guara* cut for fodder.
4. Wheat sown after *guara* kept for seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 100.83'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) No. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 682.0 lb./ac.
 (ii) 146.48 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	570.9
2.	646.5
3.	702.0
4.	808.5
S.E./mean	= 59.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(59).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of *Guara* green manure on soil fertility for Wheat yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur.
 (iii) 16.12.1952. (iv) (a) One *raja* plough, 4 *desi hal*, 6 *sohaga* and 1 horse hoe. (b) N.A. (c) 38.5 sr./ac.
 (d) 9" row to row. (e) N.A. (v) Nil. (vi) C-228 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 2.8".
 (x) 21.4.1953.

2. TREATMENTS :

1. Wheat sown after fallow (control).
2. Wheat sown after *Guara* green manured.
3. Wheat sown after *Guara* cut for fodder.
4. Wheat sown after *Guara* kept for seed.

In treatment 2, *Guara* was ploughed in field on 8.9.1952 ; in treatment 3, *guara* was cut on 10.9.1952 ; and in treatment 4 *Guara* was kept for seed and was cut on 26.11.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 106' x 12'. (b) 100.83' x 12'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination good ; condition poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1952.
 (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 452.7 lb./ac.
 (ii) 78.72 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	396.5
2.	445.1
3.	441.3
4.	527.7
S.E./mean	= 32.14 lb./ac.

Crop :- Wheat.

Ref :- Pb. 50(15).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the residual effect of manures applied to maize on the subsequent Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur.
 (iii) 7.11.1950. (iv) (a) 1 *raja* 5 *desi hal*, and 6 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil.
 (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding cum hoeing. (ix) 5.19". (x) 22.4.1951.

2. TREATMENTS :

1. Control.
 2. 100 lb./ac. of N as F.Y.M.
 3. 100 lb./ac. of N as A/S.
 4. 100 lb./ac. of N as Ammo. Phos.
 5. 100 lb./ac. of N as G.N.C.
 6. 125 lb./ac. of P_2O_5 as Super.
- Manures applied to previous maize crop.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) $8' \times 85.07'$. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1951. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1435 lb./ac.
 (ii) 171.2 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1389
2.	1403
3.	1537
4.	1537
5.	1452
6.	1290
S.E./mean	= 85.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 51(83).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the residual effect of manures applied to maize crop on subsequent Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Wheat—Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 1.11.1951. (iv) (a) 1 *raja* plough, 4 *desi kal* and 1 *sohga*. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 3.85". (x) 15.4.1952.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 100 lb./ac. of N as G.N.C.
6. 125 lb./ac. of P_2O_5 as Super.

Manures applied to previous maize crop.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) $8' \times 85.07'$. (v) No. (vi) Yes.

4. GENERAL :

- (i) Germination good ; condition fair to satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-51. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2313 lb./ac.
 (ii) 269.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2053
2.	2281
3.	2613
4.	2384
5.	2413
6.	2135
S.E./mean	= 130.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(54).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different doses of N and P_2O_5 on yield of Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 6 and 7.11.1952.
 (iv) (a) 1 raja plough, 7 desi hal, 4 sohaga and 1 horse hoe. (b) N.A. (c) 1 md./ac. (d) 9' row to row.
 (e) N.A. (v) Nil. (vi) C-518 (m:Jiu n). (vii) Irrigated. (viii) 3 hoeings and weeding. (ix) 2.8". (x) 22.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=25$, $N_2=50$ and $N_3=75$ lb./ac.(2) 4 levels of P_2O_5 : $P_0=0$, $P_1=20$, $P_2=40$ and $P_3=60$ lb./ac.N as A/S and P_2O_5 as Super broadcast on 5.11.1952.

3. DESIGN :

- (i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) $51.5' \times 11'$. (b) $49.5' \times 9'$. (v) One foot left around (vi) Yes.

4. GENERAL :

- (i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) —. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3114 lb./ac.
 (ii) 438.7 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	2530	2979	2615	2904	2757
N_1	3133	3376	3133	3435	3269
N_2	3036	3300	3457	3061	3214
N_3	3234	3432	3253	2942	3215
Mean	2983	3272	3115	3086	3114

S.E. of any marginal mean = 109.7 lb./ac.
 S.E. of body of table = 219.3 lb./ac.

Crop :-Wheat (*Rabi*).

Ref :-Pb. 51(92).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'M'.

Object :-To study the effect of different doses of N, P₂O₅ and K₂O on yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 5.11.1951. (iv) (a) 8 *desi hal* and 9 *sohaga*. (b) N.A. (c) 32 sr./ec. (d) and (e) N.A. (v) Nil. (vi) C—518 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.85°. (x) 17.4.1952.

2. TREATMENTS:

1. Control.
 2. 14.06 lb./ac. of N + 5.125 lb./ac. of P₂O₅ + 2.81 lb./ac. of K₂O.
 3. 28.12 lb./ac. of N + 10.25 lb./ac. of P₂O₅ + 5.62 lb./ac. of K₂O.
 4. 42.18 lb./ac. of N + 15.375 lb./ac. of P₂O₅ + 8.43 lb./ac. of K₂O.
 5. 56.24 lb./ac. of N + 20.5 lb./ac. of P₂O₅ + 11.24 lb./ac. of K₂O.
 6. 70.30 lb./ac. of N + 25.625 lb./ac. of P₂O₅ + 14.05 lb./ac. of K₂O.
- N as A/S applied on 8.12.1951. Source of P₂O₅ is Super and that of K₂O is Pot. Sul.

3. DESIGN:

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 50'×15'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1389 lb./ac.
 (ii) 125.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	770
2.	998
3.	1339
4.	1630
5.	1834
6.	1764
S.E./mean	=51.25 lb./ac.

Crop :-Wheat.

Ref :-Pb. 52(56).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'M'.

Object :-To study the effect of different doses of N, P₂O₅ and K₂O on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (p) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 26.11.1952. (iv) (a) 2 *raja* plough, 4 *desi hal*, 5 *sohaga* and 1 roller. (b) N.A. (c) 32 sr./plot. (d) 9" row to row. (e) N.A. (v) Nil. (vi) C—518 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.8°. (x) 29.4.1953.

2. TREATMENTS:

1. Control.
 2. 14.06 lb./ac. of N + 5.125 lb./ac. of P₂O₅ + 2.81 lb./ac. of K₂O.
 3. 28.12 lb./ac. of N + 10.25 lb./ac. of P₂O₅ + 5.62 lb./ac. of K₂O.
 4. 42.18 lb./ac. of N + 15.375 lb./ac. of P₂O₅ + 8.43 lb./ac. of K₂O.
 5. 56.24 lb./ac. of N + 20.5 lb./ac. of P₂O₅ + 11.24 lb./ac. of K₂O.
 6. 70.30 lb./ac. of N + 25.625 lb./ac. of P₂O₅ + 14.05 lb./ac. of K₂O.
- N as A/S broadcast on 10.1.1953, P₂O₅ as Super on 26.11.1952, while K₂O as Pot. Sul. on 26.11.1952.

3. DESIGN:

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 50'×15'. (b) 43.22'×12'. (v) 1½' on breadth sides and approx 3½' on length sides. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1667 lb./ac.
 (ii) 192.1 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	864
2.	1337
3.	1703
4.	1843
5.	2082
6.	2172
S.E./mean	=78.4 lb./ac.

Crop :- Wheat.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 53 (100).

Type :- 'M'.

Object :—To study the effect of time of application of A/S on Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Wheat-fallow-wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 29.11.1953. (iv) (a) 2 *raja* plough, 3 *desi* plough, 1 roller and 5 *sohaga*. (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 17.5.1954.

2. TREATMENTS :

- 50 lb./ac. of N as A/S half applied before sowing and half applied with first 3 irrigations on 29.1.1954, 11.3.1954 and 4.4.1954.
- 50 lb./ac. of N as A/S half applied before sowing, and half applied after earing on 27.2.1954.
- 50 lb./ac. of N as A/S applied at the time of sowing.
- 50 lb./ac. of N as A/S applied with 1st irrigation.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 106'×12'. (b) 102.16'×10.8'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination and condition good. Slight lodging due to hailstorm. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Hail storm effected the crop to the extent of 40%. (vii) Nil.

5. RESULTS :

- (i) 1416 lb./ac.
 (ii) 219.4 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1526
2.	1403
3.	1330
4.	1403
S.E./mean	= 109.7 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53 (99).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of A/S and C/N on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat Maize-Wheat. (b) Maize. (c) 20 lb./ac. of N as A/S and 20 lb./ac. of P_2O_5 as Super applied on 18.7.1953. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 28.11.1953. (iv) (a) 2 *raja* plough, 3 *desi* plough, 5 *sohaga* and 1 horse hoe. (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) 20 lb./ac. of P_2O_5 as Super drilled before sowing. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 29.4.1954.

2. TREATMENTS :

1. Control (no manure).
 2. 40 lb./ac. of N as A/S.
 3. 40 lb./ac. of N as C/N.
- Manures applied with 1st irrigation on 29.1.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 106' x 12'. (b) 102.15' x 10.66'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and condition good. Lodging in manured plots. (ii) Rust attack. (iii) Grain and straw weight. (iv) (a) 1953 to 1955. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Hailstorm affected the crop and caused lodging. (vii) Nil.

5. RESULTS :

- (i) 1314 lb./ac.
(ii) 240.3 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1563
2.	989
3.	1389
S.E./mean	= 120.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(58).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the method of application of A/S to Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.12.1952. (iv) (a) 1 *raja* plough, 4 *desi hal*, 6 *sohaga* and 1 roller. (b) N.A. (c) One md./ac. (d) 9" row to row. (e) N.A. (v) 30 lb./ac. of P_2O_5 as Super before sowing. (vi) C-281 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 2.8". (x) 30.4.1953.

2. TREATMENTS :

1. Control.
2. 40 lb./ac. of N as A/S applied with 1st irrigation.
3. 40 lb./ac. of N as A/S spread before sowing.
4. 40 lb./ac. of N as A/S drilled at 4" deep at sowing.
5. 40 lb./ac. of N as A/S spread after sowing.

3. DESIGN :

(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 12' x 44.8'. (b) 10.5' x 41.48'. (v) 2 rows on each side of length and 1½' on each side of breadth. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (v) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1356 lb./ac.
 (ii) 160.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	738
2.	1762
3.	1427
4.	1327
5.	1528
S.E./mean	=71.6 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(96).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of method of application of A/S to Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Cotton-Wheat. (b) Cotton. (c) 8 C.L. of F.Y.M. on 5.5.1953. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.11.1953. (iv) (a) one *raja* plough, 6 *desi* plough and 3 *sohaga*. (b) N.A. (c) 35 sr./ac. (d) 9" row to row. (e) N.A. (v) 25 lb./ac. of P₂O₅ as Super applied 15 days before sowing to all plots. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 24.4.1954.

2. TREATMENTS :

- Control (no manure).
- 40 lb./ac. of N as A/S spread before sowing.
- 40 lb./ac. of N as A/S spread after sowing.
- 40 lb./ac. of N as A/S drilled 4" deep at sowing.
- 40 lb./ac. of N as A/S applied with 1st irrigation on 7.1.1954.

3. DESIGN :

- (i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 30' x 20'. (b) 25.90' x 18.66'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination good, crop condition good. Slight lodging due to hailstorm. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Slight damage by hailstorm. (vii) Nil.

5. RESULTS :

- (i) 1352 lb./ac.
 (ii) 170.4 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	943
2.	1462
3.	1502
4.	1497
5.	1358
S.E./mean	=76.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(98).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the response of N, P₂O₅ and K₂O to the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton-fodder-Wheat. (b) *Guara*. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 26.11.1953. (iv) (a) 2 *raja 7 desi*, 5 *sohaga* and 1 horse hoe. (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.33". (x) 28.4.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N as A/S : N₀=0, N₁=25 and N₂=50 lb./ac.
 (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=20 and P₂=40 lb./ac.
 (3) 3 levels of K₂O as Pot. Sul : K₀=0, K₁=8 and K₂=16 lb./ac.

3. DESIGN :

(i) 3³ partially confounding W, X, Y, Z components of NPK. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 34' × 10'. (b) 31.42' × 8.66' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) Not contd. (b) No. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1320 lb./ac.
 (ii) 239.7 lb./ac.
 (iii) K effect is highly significant, while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	1213	1336	1286	1278	1105	1372	1358
N ₁	1403	1297	1340	1347	1245	1420	1374
N ₂	1317	1367	1322	1335	1256	1350	1401
Mean	1311	1333	1316	1320	1202	1381	1378
K ₀	1211	1175	1220	1202			
K ₁	1364	1480	1298	1381			
K ₂	1358	1345	1431	1378			

S E. of marginal means
 S.E. of body of any table

=39.9 lb./ac.
 =69.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(95).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different doses of N and P₂O₅ on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize and Peas. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 8.11.1953. (iv) (a) 7 *desi hal* and 3 *sohaga*. (b) and (c) N.A. (d) 9" between rows. (e) N.A. (v) Maize and Peas were ploughed in the fields for green manuring on 23.8.1953. (vi) C-518 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.33" (x) 8.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=30$ and $N_3=40$ lb./ac.

(2) 4 levels of P_2O_5 as Super : $P_0=0$, $P_1=20$, $P_2=30$ and $P_3=40$ lb./ac.

P_2O_5 broadcast before sowing, while A/S broadcast on 10.3.1954.

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) $52' \times 11'$. (b) $47.16' \times 9.62'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Crop slightly lodged. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Hailstorm effected the crop adversely particularly in plots with high dose of N.

5. RESULTS :

(i) 1264 lb./ac.

(ii) 162.2 lb./ac.

(iii) N effect alone is highly significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	P_3	Mean
N_0	1469	1423	1577	1450	1480
N_1	1503	1670	1500	1373	1512
N_2	1225	1333	1151	1120	1207
N_3	775	805	981	867	857
Mean	1243	1308	1302	1203	1264

S.E. of any marginal mean

=40.6 lb./ac.

S.E. of body of table

=81.1 lb./ac.

Crop :- Wheat.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52(57).

Type :- 'M'.

Object :—To study the effect of different combinations of N and P_2O_5 on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Poor sandy loam. (b) Refer soil analysis, Jullundur. (iii) 28.11.1952. (iv) (a) 1 *raja* plough, 3 *desi hal*, 5 *sohaga* and 2 horse hoe. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 2.8". (x) 2.5.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=30$ and $N_3=40$ lb./ac.

(2) 4 levels of P_2O_5 as Super : $P_0=0$, $P_1=30$, $P_2=40$ and $P_3=50$ lb./ac.

Super broadcast on 28.11.1952. Half dose of A/S broadcast on 28.11.1952 and other half from 4 to 6.1.1953.

3. DESIGN :

(i) 4×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) $72.6' \times 7'$. (b) $65.6' \times 7'$. (v) $3\frac{1}{2}'$ left on each side of length. (vi) Yes.

4. GENERAL :

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1380 lb./ac.
- (ii) 339.4 lb./ac.
- (iii) N effect alone is highly significant.
- (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	P ₃	Mean
N ₀	696	1090	843	803	858
N ₁	1505	1218	1582	1530	1459
N ₂	1298	1374	1246	1799	1429
N ₃	1930	2067	1557	1539	1773
Mean	1357	1437	1307	1418	1380

S.E. of any marginal mean = 84.9 lb./ac.
S.E. of body of table = 169.7 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(94).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different doses of N and P₂O₅ on Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Poor sandy loam. (b) Refer soil analysis, Jullundur. (iii) 5,7.11.1953.
- (iv) (a) 4 *desi hal* and 5 *sohaga*. (b) N.A. (c) 35 sr./ac. (d) 6" from row to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 10.33". (x) 17.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 levels of N as A/S : N₀=0, N₁=20, N₂=30 and N₃=40 lb./ac.
- (2) 4 levels of P₂O₅ as Super : P₀=0, P₁=20, P₂=30 and P₃=40 lb./ac.

3. DESIGN :

- (i) 4×4 Fact. R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 75'×8'. (b) 71'×6.66'. (v) 8" left on either side of breadth and 2" left on either side of length. (vi) Yes.

4. GENERAL :

- (i) Germination good, except in N₀ plots where germination and condition was poor. (ii) Nil. (iii) Grain and straw weight. (iv) (a) 1952—1954 (after 1952 dose of P₂O₅ changed). (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Hailstorm and rain 2.5" on 23.2.1954, was severe and damaged the crop. (vii) Planned for six but conducted in 4 replications only.

5. RESULTS :

- (i) 921.4 lb./ac.
- (ii) 302.0 lb./ac.
- (iii) N effect alone is highly significant.
- (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	P ₃	Mean
N ₀	219.1	799.5	310.9	420.5	437.5
N ₁	820.2	731.4	636.6	758.0	736.5
N ₂	1119.3	947.5	997.9	1376.9	1110.4
N ₃	1406.5	1483.5	1403.5	1311.7	1401.3
Mean	891.3	990.5	837.2	966.8	921.4

S.E. of any marginal mean = 75.5 lb./ac.
S.E. of body of table = 151.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49(4).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :- To find the manurial schedule for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20,21.11.1949. (iv) (a) 4 ploughings and 4 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) Nil. (ix) 15.23". (x) 10.5.1950.

2. TREATMENTS :

1. Control (no manure).
2. 24 lb./ac. of N as A/S.
3. 36 lb./ac. of N as A/S.
4. 24 lb./ac. of N as Ammo. Phos.
5. 36 lb./ac. of N as Ammo. Phos.
6. 30 lb./ac. of P_2O_5 as Super.
7. 45 lb./ac. of P_2O_5 as Super.
8. 24 lb./ac. of N as A/S + 30 lb./ac. of P_2O_5 as Super.
9. 36 lb./ac. of N as A/S + 45 lb./ac. of P_2O_5 as Super.

Super drilled 3 to 4" deep before sowing and A/S applied with 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 52' x 10'. (b) 52' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1687 lb./ac.
 (ii) 147.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1594
2.	1669
3.	1788
4.	1583
5.	1659
6.	1766
7.	1702
8.	1637
9.	1788
S.E./mean	= 73.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 50(1).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :- To study the effect of manures on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Soyabean. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1950. (iv) (a) and (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) One weeding. (ix) 14.82" (x) 4.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of N as A/S : $N_0=0$ and $N_1=25$ lb./ac.
- (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=32$ lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $7'3'' \times 49'6''$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1615 lb./ac.
 (ii) 351.8 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	1795	1724	1760
P_1	1260	1681	1471
Mean	1528	1703	1615

S.E. of any marginal mean = 124.4 lb./ac.
 S.E. of body of table = 175.9 lb./ac.

Crop :-Wheat.

Ref:- Pb. 51(61).

Site :-Distt. and Demonstration Farm, Kangra.

Type :-'M'.

Object :—To study the effect of methods of placement of fertilizers on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 21.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) C—250 (medium). (vii) Irrigated. (viii) One weeding. (ix) 12.03". (x) 14.5.19 2.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=25$ lb./ac.

(2) 3 applications of P_2O_5 : $P_0=0$ and $P_1=25$ lb./ac. broadcast and $P_1'=25$ lb./ac. applied by depth application.

P_2O_5 as Super applied at the time of sowing.

3. DESIGN :

i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 1/101.7 ac. (b) 1/132 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b)—. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1487 lb./ac.
 (ii) 264.8 lb./ac.
 (iii) N, P effects and interaction $N \times P$ are highly significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_1'	Mean
N_0	1056	1434	1417	1302
N_1	895	2321	1799	1672
Mean	975	1877	1608	1487

S.E. of marginal mean of P = 93.6 lb./ac.
 S.E. of marginal mean of N = 76.4 lb./ac.
 S.E. of body of table; = 132.4 lb./ac

Crop :-Wheat.

Ref :-Pb. 51(62).

Site :-Distt. and Demonstration Farm, Kangra.

Type :-'M'.

Object :-To study the effect of A/S and C/N applied alone and in combination with lime on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 17, 18.11.1951. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 6 ch./plot. (d) 6" row to row. (e) N.A. (v) Nil. (vi) C—253 (medium). (vii) Irrigated. (viii) One weeding. (ix) 12.03". (x) 24.4.1952.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.(2) 5 applications of N : $N_0=0$, $N_1=20$ lb./ac. of N as A/S, $N_2=40$ lb./ac. of N as A/S, $N_3=20$ lb./ac. of N as C/N and $N_4=40$ lb./ac. of N as C/N.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) $1/103.5$ ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1315 lb./ac.
(ii) 294.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	1211	1184	1321	1297	1221	1247
L_1	1311	1577	1610	1467	948	1383
Mean	1261	1381	1466	1382	1085	1315

S.E. of marginal mean of N = 104.0 lb./ac.
S.E. of marginal mean of L = 65.8 lb./ac.
S.E. of body of table = 147.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 52(134).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :-To study the effect of different methods of application of A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize-Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.10.1952. (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 5 ch./plot. (d) 6" row to row. (e) N.A. (v) Nil. (vi) C—253 (medium). (vii) Irrigated. (viii) One weeding. (ix) 13.19". (x) 12.4.1953.

2. TREATMENTS :

- Control.
- 20 lb./ac. of N as A/S broadcast before sowing.
- 20 lb./ac. of N as A/S applied mixed with seed.
- 20 lb./ac. of N as A/S applied 1" below seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 81'×4.5'. (b) 81'×4.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2147 lb./ac.
 (ii) 199.2 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1936
2.	2197
3.	2274
4.	2182
S.E./mean	=99.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 52(135).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :- To study the effect of different methods of application of A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize-Wheat. (d) Maize, (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28.10.1952. (iv) (a) 4 Ploughings and 5 *sohaga*. (b) N.A. (c) 6 cb./plot. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated (viii) One weeding. (ix) 13.19". (x) 2.5.1953.

2. TREATMENTS :

- Control (no manure).
- 20 lb./ac. of N as A/S broadcast before sowing.
- 20 lb./ac. of N as A/S applied mixed with seed.
- 20 lb./ac. of N as A/S applied 1" deep below the seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 7½'×49½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1119 lb./ac.
 (ii) 143.8 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	971
2.	1190
3.	1186
4.	1127
S.E./mean	=71.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 52 (136).

Site :- Distt. and Demonstration farm, Kangra.

Type :- 'M'

Object :—To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Soyabean. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 7.11.1952. (iv) (a) 5 plough and 4 *sohaga*. (b) N.A. (v) 5 ch./plot. (d) and (e) N.A. (v) Nil. (vi) C-253 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 13.19. (x) 24.4.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as A/S by broadcast.
3. 20 lb./ac. of P_2O_5 as Super by broadcast.
4. 20 lb./ac. of P_2O_5 as Super drilled 1" below seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $81' \times 4\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) —. (v) and (vii) Nil.

5. RESULTS :

- (i) 2168 lb./ac.
 (ii) 177.9 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2021
2.	2453
3.	2129
4.	2067
S.E./mean	= 88.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 52 (137).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :—To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize-Wheat. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 14.11.1952. (iv) (a) 5 ploughings and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 2.5.1953.

2. TREATMENTS :

1. Control (no manure).
2. 20 lb./ac. of N as A/S by broadcast.
3. 20 lb./ac. of P_2O_5 as Super by broadcast.
4. 20 lb./ac. of P_2O_5 as Super drilled 1" below seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $81' \times 4\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Straw and grain yield. (iv) (a) Not contd. (b) No. (c) .
 (v) (a) Nil. (b) —. (vi) and (v) Nil.

5. RESULTS :

- (i) 1438 lb./ac.
 (ii) 161.0 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1329
2.	1437
3.	1494
4.	1490
S.E./mean	= 80.5 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(47).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :- To determine the best method of application of A/S to Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Paddy—Wheat. (b) Paddy. (c) Heavily manured with F.Y.M., Super and A/S. Details N.A. (ii) (a) Clay loam. (b) N.A. (iii) 16.11.1953. (iv) (a) 3 ploughings ; 2 plankings. (b) N.A. (c) 6 ch. plot. (d) 8 rows/plot. (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) Nil. (ix) 21.60." (x) 3.5.1954.

2. TREATMENTS :

- Control (no manure).
- 60 lb./ac. of N as A/S drilled below the seed row with *pore*.
- 60 lb./ac. of N as A/S applied in contact with the seed.
- 60 lb./ac. of N as A/S broadcast before sowing.
- 60 lb./ac. of N as A/S broadcast with 1st irrigation in Dec. 1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $4\frac{1}{2}' \times 81'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Below normal. Crop lodged in manured plots. (ii) Brown and black rusk attack on 2 and 3 treatments. (iii) Germination count, straw weight and grain weight. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1868 lb./ac.
 (ii) 210.3 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2005
2.	1905
3.	1921
4.	1805
5.	1706
S.E./mean	= 105.1 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(48).

Site :- Distt. and Demonstration Farm, Kangra.

Type:- 'M'.

Object :—To study the effect of N and P_2O_5 alone and in combination on Wheat.

1. BASAL CONDITIONS :

(i) (a) Soyabean—Wheat. (b) Soyabean. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 14,15.11.1953.
 (iv) (a) 3 ploughings and 2 plankings. (b) Broadcast. (c) 35 sr./ac. (d) and (e) —. (v) Nil. (vi) C-250
 (medium). (vii) Irrigated. (viii) Nil. (ix) 21.60". (x) 2.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=30$ lb./ac.(2) 3 applications of N : $N_0=0$, $N_1=30$ lb./ac. of N as A/S and $N_2=30$ lb./ac. of N as C/N.

Fertilizers broadcast at the time of sowing.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $7' \times 77'-9\frac{1}{2}"$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Attack of brown and black rust. (iii) Grain and straw yield. (iv) (a) 1953-54.
 (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1621 lb./ac.

(ii) 86.3 lb./ac.

(iii) N effect alone is highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	1306	1774	1728	1603
P_1	1414	1746	1756	1639
Mean	1360	1760	1742	1621

S.E. of marginal mean of N = 30.5 lb./ac.

S.E. of marginal mean of P = 24.9 lb./ac.

S.E. of body of table = 43.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 51(55).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :—To find out the best manurial formula for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 2.12.1951. (iv) (a) 4 *desi* ploughings, 1 *raja*
 and 5 *sohaga*. (b) N.A. (c) 35 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated.
 (viii) One weeding. (ix) 3.56". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N : $N_0=0$, $N_1=25$, $N_2=50$ and $N_3=75$ lb./ac.(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=25$ lb. and $P_2=50$ lb./ac. P_2O_5 as Super broadcast before sowing and A/S on 22.1.1952.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) $81' \times 6'$. (b) $73'-4" \times 6'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (v) and (vi) Nil.

5. RESULTS :

- (i) 1858 lb./ac.
 (ii) 178.5 lb./ac.
 (iii) P effect alone is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1710	1905	1939	1851
N ₁	1897	1877	1816	1863
N ₂	1795	1952	1964	1904
N ₃	1621	1865	1956	1814
Mean	1756	1900	1919	1858

S.E. of marginal mean of N = 42.1 lb./ac.
 S.E. of marginal mean of P = 36.4 lb./ac.
 S.E. of body of table = 72.9 lb./ac.

Crop :- Wheat.

Site :- Agri. Stn., Karmal.

Ref :- Pb. 51(56).

Type :- 'M'.

Object :—To study the effect of A/S and Super on Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.10.1951. (iv) (a) 3 ploughings and 4 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 3.56". (x) 1.4.1952.

2. TREATMENTS :

1. Control (no manure).
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as Ammo. Phos.
4. 125 lb./ac. of P₂O₅ as Super.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) 80'×12'. (b) 80'×11'. (v) One foot left out from plot to plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1839 lb./ac.
 (ii) 299.6 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1737
2.	1929
3.	1933
4.	1757
S.E./mean	= 86.5 lb./ac.

Crop :- Wheat.
Site :- Agri. Stn., Karnal.

Ref :- Pb. 51(57).
Type :- 'M'.

Object :- To study the effect of A/S and Super on the yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 25.10.1951. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 3.56". (x) 1.4.1952.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as Ammo. Phos.
4. 125 lb./ac. of P_2O_5 as Super.
A/S and Super broadcast on 5.12.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'×80'. (b) 10'×80'. (v) 2' left out from plot to plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1640 lb./ac.
- (ii) 290.9 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1344
2.	2219
3.	1748
4.	1248
S.E./mean	= 118.8 lb./ac.

Crop :- Wheat.
Site :- Agri. Stn., Karnal.

Ref :- Pb. 49(63).
Type :- 'M'.

Object :- To find the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 15.12.1949. (iv) (a) 4 ploughing and 5 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium); (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 25.5.1950.

2. TREATMENTS :

1. Control (no manure).
2. 50 lb./ac. of N as A/S applied on 16.1.1950.
3. 50 lb./ac. of N as A/N.
4. 50 lb./ac. of N as Ammo. Phos. applied on 16.1.1950.
5. 50 lb./ac. of N as F.Y.M. applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 81'×13½'. (b) 81'×13½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1550 lb./ac.
 (ii) 291.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	928
2.	1970
3.	1582
4.	1972
5.	1300
S.E./mean	= 119.0 lb./ac.

Crop :- Wheat.

Site :- Agri. Stn., Karnal.

Ref :- Pb. 49 (64).

Type :- 'M'.

Object :- To find a suitable form and dose of N for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 13.12.1949. (iv) (a) 5 ploughings and 4 *sohaga*. (b) N.A. (c) 35 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 24.5.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 sources of N : $S_1=A/S$, $S_2=Ammo. Phos.$ and $S_3=F.Y.M.$ (2) 2 doses of N : $N_1=40$ and $N_2=60$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $80' \times 11'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b)—. (c) No. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1293 lb./ac.
 (ii) 139.0 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	Control = 1196 lb./ac.		Mean
	N_1	N_2	
S_1	1332	1343	1337
S_2	1325	1292	1309
S_3	1321	1239	1280
Mean	1326	1291	1309

S.E. of marginal mean of S = 40.1 lb./ac.
 S.E. of marginal mean of N = 32.8 lb./ac.
 S.E. of body of table = 56.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 49 (65).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :-To study the effect of A/S and Ammo. Phos. in presence and absence of Super.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (for green manuring). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 11.12.1949. (iv) (a) to (e) N.A. (v) Field green manured with *Guara*. (vi) C-217 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 24.5.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=25$ lb./ac.(2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo. Phos.$

Super applied on 11.12.1949 while A/S and Ammo. Phos., applied to supply 40 lb./ac. of N on 16.1.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 81'×13.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1926 lb./ac.

(ii) 166.0 lb./ac.

(iii) S and "control vs. others effects" are highly significant.

(iv) Av. yield of grain in lb./ac.

Control =1720 lb./ac.

	P_0	P_1	Mean
S_1	2062	2135	2099
S_2	1931	1784	1857
Mean	1996	1960	1978

S.E. of any marginal mean = 47.9 lb./ac.

S.E. of body of table = 67.8 lb./ac.

Crop :- Wheat.

Ref :- Pb. 49(66).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :-To study the residual effect of manures applied to Berseem crop on succeeding Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 8.12.1949. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) N.A. (vi) C—591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 23.5.1950.

2. TREATMENTS :

1. Control (no manure).

2. 100 lb./ac. of N as A/S applied to previous crop of berseem.

3. 100 lb./ac. of N and 125 lb./ac. of P_2O_5 as Ammo. Phos. applied to previous crop of berseem.4. 125 lb./ac. of P_2O_5 as Super applied to previous crop of berseem.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 11'×81'. (b) 11'×81'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1410 lb./ac.

(ii) 209.6 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1323
2.	1361
3.	1438
4.	1516
S.E./mean	=85.6 lb./ac.

Crop :- Wheat.

Site :- Agri. Stn., Karnal

Ref :- Pb. 49(69).

Type :- 'M'.

Object :- To study the residual effect of manures applied to Wheat crop last year.

1. BASAL CONDITIONS :

(i) (a) Wheat-Fallow-Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Clayey loam. (b) N.A. (iii) 8.12.1949. (iv) (a) to (e) N.A. (v) N.A. (vi) C-591 medium. (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 23.5.1950.

2. TREATMENTS :

1. Control (no manure).

2. 100 lb./ac. of N as A/S applied to previous crop of wheat.

3. 100 lb./ac. of N and 125 lb./ac. of P₂O₅ as Ammo. Phos. applied to previous crop of wheat.

4. 125 lb./ac. of P₂O₅ as Super applied to previous crop of wheat.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 80'×11'. (b) 80'×11'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) No. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1121 lb./ac.

(ii) 232.9 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1159
2.	1122
3.	1129
4.	1073
S.E./mean	=95.0 lb./ac.

Crop :-Wheat.

Ref :-Pb. 50(73).

Site :-Agri. Stn., Karnal.

Type :-'M'.

Object :-To find the best manurial combination for Wheat when sown after *guara*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 8.12.1950. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) *Guara* green manured. (vi) C— 591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.23". (x) 6.6.1951.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 81'×8'. (b) 75'-7½'×8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 2157 lb./ac.

(ii) 141.8 lb./ac.

(iii) N and P effects are highly significant while interaction N × P is not significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1771	2069	2115	1985
N_1	1882	2288	2354	2175
N_2	1881	2445	2603	2310
Mean	1845	2267	2357	2157

S.E. of any marginal mean

=33.4 lb./ac.

S.E. of body of table

=57.9 lb./ac.

Crop :-Wheat.

Ref :-Pb. 50(74).

Site :-Agri. Stn., Karnal.

Type :-'M'.

Object :-To find out the best manurial combination for Wheat crop when sown in fallow fields.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 3.12.1950. (iv) (a) 4 ploughings and 5 *sohaga*. (c) 1 md./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.23". (x) 24.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 81'×8'. (b) 75'-7½'×8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory and condition normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1845 lb./ac.
 (ii) 110.2 lb./ac.
 (iii) All the effects are highly significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1421	1467	1588	1492
N ₁	1639	1924	1969	1844
N ₂	1864	2268	2469	2200
Mean	1641	1886	2009	1845

S.E. of any marginal mean = 26.0 lb./ac.
 S.E. of body of table = 45.0 lb./ac.

Crop :- Wheat.

Site :- Agri. Stn., Karnal.

Ref :- Pb. 49(67).

Type :- 'M'.

Object : To study the effect of A/S and Super on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 8.12.1949. (iv) (a) 4 ploughings and 4 *sohaga*. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 24.5.1950.

2. TREATMENTS :

- Control (no manure).
- A/S at 100 lb./ac. of N.
- Ammono. Phos. at 100 lb./ac. of N and 125 lb./ac. of P₂O₅.
- Super at 125 lb./ac. of P₂O₅.

Super applied on 8.12.1949 before sowing while A/S and Ammono. Phos. applied half dose before sowing on 8.12.49 and half dose on 16.1.1949 with 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 81'×11'. (b) 80'×11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and condition good in plots with treatments 2 and 3 while it is poor in 1 and 4. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949-50. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1605 lb./ac.
 (ii) 544.8 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1336
2.	2121
3.	1860
4.	1102
S.E./mean	= 222.4 lb./ac.

Crop :- Wheat.

Ref :- Pb. 50(75).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :- To study the effect of A/S and Super on Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Berseem—Wheat. (b) Berseem. (c) {N.A. (ii) (a) Clay loam. [(b) N.A. (iii) 23.11.50. (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 34 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 2.23". (x) 11.6.1951.

2. TREATMENTS :

1. Control (no manure).
2. A/S at 100 lb./ac. of N.
3. Ammo. Phos. at 100 lb./ac. of N and 125 lb./ac. of P₂O₅.
4. Super at 125 lb./ac. of P₂O₅.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) N.A. (b) 13½' × 80'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and condition satisfactory in plots with treatments 1 and 4 while it is below normal in plots with treatments 2 and 3. (ii) N.A. (iii) Grain yield. (iv) (a) 1949-1950. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1629 lb./ac.
 (ii) 150.4 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1161
2.	1810
3.	2310
4.	1233
S.E./mean	= 43.4 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(24).

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :- To find a suitable dose of A/S for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Wheat-Paddy. (b) Paddy. (b) N.A. (ii) (a) Loam. (b) N.A. (iii) 10.11.1952. (iv) (a) 2 *desi* ploughings and 3 plankings. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) 200 mds. of F.Y.M. broadcast 26.10.1952. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 10.51". (x) 6.5.1953.

2. TREATMENTS :

1. Control (no manure).
 2. 30 lb./ac. of N as A/S.
 3. 40 lb./ac. of N as A/S.
- A/S applied in January 1953 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 20' × 8'-3". (b) 20' × 8'-3". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory (ii) No. (iii) Grain yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Weather during crop season was quite favourable. (vii) Nil.

5. RESULTS :

(i) 2393 lb./ac.
 (ii) 310.4 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.^a

Treatment	Av. yield
1.	2334
2.	2342
3.	2503
S.E./mean	=155.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(42).

Site :- Rice Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To find out suitable dose of A/S for Wheat.

1. BASAL CONDITIONS :

(i) (a) Paddy-Wheat-Paddy. (b) Paddy. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 18.11.1953. (iv) (a) 2 *desi* ploughings and 3 plankings. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) 200 mds./ac. of F.Y.M. broadcast. (vi) C—250 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 18.09". (x) N.A.

2. TREATMENTS :

1. No manure.
 2. 30 lb./ac. of N as A/S.
 3. 40 lb./ac. of N as A/S.
 4. 50 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 11'3" × 26'. (v) Two rows along the length on both sides left. (vi) Yes.

4. GENERAL :

(i) There was lodging in all the plots except in those of control plots. Lodging was more in plots with treatment 4. (ii) Bunt disease due to heavy winter rains. (iii) Grain yield. (iv) (a) 1952 to 1954 with modifications. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Heavy rains and hailstorm in the month of February 1954. (vii) Nil.

5. RESULTS :

(i) 2254 lb./ac.
 (ii) 186.6 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1872
2.	2307
3.	2451
4.	2384
S.E./mean	= 93.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52 (27).

Site :- Cereal Breeding Sub-Stn., Kulu.

Type :- 'M'.

Object :—To see the effect of different combinations of A/S and Super on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize. (b) Maize. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 18.10.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) C-224 (early improved). (vii) Unirrigated. (viii) N.A. (ix) 14.44". (x) 15, 16.5.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=25$ lb./ac.

A/S and Super broadcast on 18.10.1952 before sowing.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $22' \times 4' \times 9'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2284 lb./ac.

(ii) 167.7 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	2347	2013	2180
N_1	2333	2215	2274
N_2	2374	2423	2399
Mean	2351	2217	2284

S.E. of marginal mean of N = 59.3 lb./ac.

S.E. of marginal mean of P = 48.4 lb./ac.

S.E. of body of table = 83.9 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52 (79).

Site :- Chemical Section (B. A. Farm), Rauni.

Type :- 'M'.

Object :—To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) Nil. (b) *Chari*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18.11.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.45". (x) 10.4.1953.

2. TREATMENTS :

1. Control.

2. 30 lb./ac. of N as A/S.

3. 30 lb./ac. of N as F.Y.M.

4. 40 lb./ac. of N as A/S.

5. 40 lb./ac. of N as F.Y.M.

6. 20 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as A/S.

F.Y.M. applied on 19.20.11.1952, $\frac{1}{2}$ dose of A/S on 18.11.1952 and $\frac{1}{2}$ dose of A/S on 5.1.1953 as top dressing.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 90.5'×24'. (b) 83.75'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No. lodging. (ii) Nil. (iii) Grain and stalk weights. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 821.5 lb./ac.
 (ii) 112.84 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	688.6
2.	922.6
3.	718.7
4.	939.3
5.	720.4
6.	939.3
S.E./mean	= 56.42 lb./ac.

Crop :- Wheat.

Site :- Chemical Section (B.A. Farm) Rauni.

Ref :- Pb. 53(112).

Type :- 'M'.

Object :—To find out the best source of N for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Cotton-Fallow-Wheat. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 13.11.1953. (iv) (a) 4 ploughings. (b) N.A. (c) 35 sr./ac. (d) 6" row to row. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One hoeing and two weedings. (ix) 7.25". (x) 18.4.1954.

2. TREATMENTS :

- Control (no manure).
 - 30 lb./ac. of N as A/S.
 - 30 lb./ac. of N as F.Y.M.
 - 40 lb./ac. of N as A/S.
 - 40 lb./ac. of N as F.Y.M.
 - 20 lb./ac. of N as A/S+20 lb./ac. of N as F.Y.M.
- F.Y.M. applied on 12.11.1953 and A/S applied on 17.12.1953 by broadcast method.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 45.8'×19'. (b) 1/75th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Crop lodged in Feb. 1954. (ii) Rat infestation observed in some plots. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1335 lb./ac.
 (ii) 182.0 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1125
2.	1294
3.	1519
4.	1125
5.	1556
6.	1388
S.E./mean	= 91.0 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(75).

Site :- Chemical Section (B.A. Farm), Rauni.

Type :- 'M'.

Object :—To study the residual effect of previous *guara* and *sanai* crops on the yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) As per treatments. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 17.11.1952. (iv) (a) 5 ploughings and 4 *sohaga*. (b) N.A. (c) 1 md./ac. (d) 6". (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 2.45". (x) N.A.

2. TREATMENTS :

Previous crops.

1. Fallow.
2. *Guara* green manured.
3. *Guara* sown and removed for seed.
4. *Sanai* green manured.
5. *Sanai* sown and removed for seed and fiber.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 25'×87.1'. (b) 20'×80.75'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Bhoosa* and grain yield. (iv) (a) Not contd. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 895.0 lb./ac.
 (ii) 204.16 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	582.6
2.	953.6
3.	674.4
4.	1354.1
5.	910.2
S.E./mean	=102.08 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 53(108).

Site :- Chemical Section (B.A. Farm), Rauni.

Type :- 'M'.

Object:—To study the effect of previous crops on subsequent crop of Wheat.

1. BASAL CONDITIONS :

(iv) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 5.12.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) 6.25". (x) 15.4.1954.

2. TREATMENTS :

Previous crops

1. Control (fallow).
2. *Sanai* (Sannhemp) green manured.
3. *Moong* green manured.
4. *Sanai* sown and removed for seed.
5. *Moong* sown and removed for seed.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 90.75'×24'. (b) 1/30th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) Nil. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 819.0 lb./ac.
 (ii) 166.70 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	705.0
2.	817.5
3.	900.0
4.	892.5
5.	780.0
S.E./mean	= 83.35 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(162).

Site :- Soil Sub-Stn. Agri. Farm, Rohtak.

Type :- 'M'.

Object :- To find a suitable dose of A/S and Super for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Roh tak. (iii) 14.11.1953. (iv) 4 ploughings, and 5 *sohaga*. (b) *Pore*. (c) 40 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.10". (x) 18.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=25$ lb./ac.

Super applied by *pore* while A/S applied in Dec. with 1st irrigation.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/25th. ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1848 lb./ac.
 (ii) 74.4 lb./ac.
 (iii) Only P effect is significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	Mean
P_0	1618	1699	1910	1742
P_1	1804	2122	1937	1954
Mean	1711	1910	1923	1848

S E. of marginal mean of N = 84.6 lb./ac.

S.E. of marginal mean of P = 69.0 lb./ac.

S.E. of body of table = 119.6 lb./ac.

Crop :-Wheat.

Ref :-Pb. 53(163).

Site :-Soil Sub-Stn. Agri. Farm, Rohtak.

Type :-'M'.

Object:—To find the suitable manurial treatments for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 11.11.1953. (iv) (a) 1 raja, 5 ploughings and 5 sohaga. (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C—518 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.10". (x) 18.4.1954.

2. TREATMENTS :

1. Control (no manure).
 2. 25 lb./ac. of P_2O_5 as B.M.
 3. 25 lb./ac. of P_2O_5 as B.M. compost.
 4. 25 lb./ac. of P_2O_5 as compost manure.
 5. 25 lb./ac. of P_2O_5 as B.M.+25 lb./ac. of N as A/S.
 6. 25 lb./ac. of P_2O_5 as B.M. compost+25 lb./ac. of N as A/S.
 7. 25 lb./ac. of P_2O_5 as Super.
 8. 25 lb./ac. of P_2O_5 as Super+25 lb./ac. of N as A/S.
 9. 50 lb./ac. of P_2O_5 as Super+25 lb./ac. of N as A/S.
- Time and method of application N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40th. ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. Slight lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2261 lb./ac.

(ii) 286 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2106
2.	2317
3.	2333
4.	2333
5.	2254
6.	2188
7.	2172
8.	2397
9.	2251
S.E./mean	=143.0 lb./ac.

Crop :-Wheat.

Ref :-Pb. 48(65).

Site :-Agri. Farm, Rohtak.

Type :-'M'.

Object:—To find a suitable dose of F.Y.M. for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 5.11.1948. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) D—9 (medium). (vii) Unirrigated (viii) Nil. (ix) 0.26". (x) 11.4.1949.

2. TREATMENTS :

1. Control (no manure).
2. 2½ ton/ac. of F.Y.M.
3. 5 ton/ac. of F.Y.M.
4. 7½ ton/ac. of F.Y.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 24'×66'. (b) 20'×54.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good, stand and condition poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943—1948. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 214.7 lb./ac.
 (ii) 71.02 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	211.5
2.	164.4
3.	246.6
4.	236.3
S.E./mean	=28.99 lb./ac.

Crop :- Wheat.

Site :- Agri. Farm, Rohtak.

Ref :- Pb. 49(91).

Type :- 'M'.

Object :- To study the suitability of application of compost as manure for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 28.10.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 2.15". (x) 24.4.1950.

2. TREATMENTS :

- Control (no manure).
- 8 ton/ac. of urban compost.
- 8 ton/ac. of rural compost.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 64'×17'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2231 lb./ac.
 (ii) 154.9 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2219
2.	2447
3.	2028
S.E./mean	= 63.2 lb./ac.

Crop :- Wheat.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 50(102).
Type :- 'M'.

Object :- To study the effect of A/S and Super alone and in combination on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Cotton--Wheat. (b) Cotton. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 9.11.1950.
(iv) (a) to (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) N.A. (viii) Nil. (ix) 1.83". (x) 1st week of May 1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=40$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/17.2 th. ac. (dimensions N.A.). (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor to fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 410.4 lb./ac.
(ii) 103.6 lb./ac.
(iii) N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	193.5	219.5	206.5
N_1	529.6	698.8	614.2
Mean	361.6	459.2	410.4

S.E. of marginal means = 36.6 lb./ac.

S.E. of body of table = 51.8 lb./ac.

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (Stewart's Scheme), 1953.

Site :- Ludhiana (Punjab). Type :- 'M'.

Object :- To study the effect of N and P_2O_5 on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) pH value from 7.9 to 8.6. $CaCO_3$ is between 0—3.4%, organic matter varies from 0.2 to 1.59%. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November, 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May, 1954.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 40 lb./ac. of N as A/S.
4. 40 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super.
Super drilled before sowing while N applied at the time of first irrigation.

3. DESIGN :

(i) and (ii) Two experiments were laid out in one village. Selection of villages and site of experiments was by randomisation. No. of experiments—15. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) —. (v) Jagraon and Samrala. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1914 lb./ac.
 (ii) 465.1 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1352
2.	1916
3.	2037
4.	2351
S.E./mean	=120.1 lb./ac.

Crop:-Wheat (*Rabi*). Ref :-Simple trials on cultivators' fields (Stewart's Scheme), 1953
 Site :-Jagraon (Punjab). Type :-'M'.

Objct :-To study the effect of N and P_2O_5 on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Generally light but slightly heavier. pH value varies from 8.5 to 9.0. Organic matter contents vary between 0.75 to 1.30% and $CaCO_3$: 0.3 to 4.8%. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November, 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May, 1954.

2. TREATMENTS :

- Control (no manure).
- 25 lb./ac. of N as A/S.
- 40 lb./ac. of N as A/S.
- 40 lb./ac. of N as A/S+25 lb./ac. of P_2O_5 as Super.
 Super drilled before sowing while N applied at the time of first irrigation.

3. DESIGN :

(i) and (ii) Two experiments were laid out in one village. Selection of villages and site of experiments was by randomisation. No. of experiments—17. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) —. (v) Samrala and Ludhiana (vi) and (vii) Nil.

5. RESULTS :

- (i) 1780 lb./ac.
 (ii) 168.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1504
2.	1817
3.	1873
4.	1924
S.E./mean	=40.8 lb./ac.

Crop :- Wheat (*Rabi*). **Ref :-** Simple trials on cultivators' fields (Stewart's Scheme), 1953
Site :- Samarala (Panjab). **Type :-** 'M'.

Object :- To study the effect of N and P_2O_5 on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) pH value varies from 7.9 to 8.9 Organic matter content is between 0.2 to 0.8% and Ca CO_3 between 0.5 to 9.5%. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November, 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May 1954.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 40 lb./ac. of N as A/S.
4. 40 lb./ac. of N as A/S.+25 lb./ac. of P_2O_5 as Super.
Super drilled before sowing while N applied at the time of first irrigation.

3. DESIGN :

(i) and (ii) Two experiments were laid out in one village. Selection of villages and site of experiments was by randomisation. No. of experiments—14. (iii) (a) and (b) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c)—. (v) Jagraon and Ludhiana. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1394 lb./ac.
- (ii) 233.7 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	807
2.	1424
3.	1554
4.	1789
S.E./mean	= 62.5 lb./ac.

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nilokheri (Punjab). **Type :-** 'M'.

Object :- I. (b) (i) To study different levels and types of N and P.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin-impregnated with salts-Loam-pH. 7.7. (iii) Nil. (iv) N.A. (v) N.A. (vi) November-December. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

- O =Control.
P =Super at 20 lb./ac. of P_2O_5
 N_1P =A/S at 20 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.
 N_2P =A/S at 40 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.
 $N_1'P$ =A/N at 20 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.
 $N_2'P$ =A/N at 40 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.
Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1331
P	1627
N ₁ P	1777
N ₂ P	1707
N ₁ 'P	1700
N ₂ 'P	1871
G.M	1669
S.E./mean	= 143.5 lb./ac.
No. of experiments	3

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T. C. M.), 1953.

Centre :- Nilokheri (Punjab).

Type :- 'M'.

Object :- I (b) (ii) To study different levels and types of N and P.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts-Loam-pH. 7.7. (iii) Nil. (iv) N.A. (v) N.A. (vi) November-December. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O=Control.

P =20 lb./ac. of P₂O₅ as Super.

N₁P =A/S at 20 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.

N₂P =A/S at 40 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.

N₁'P=Urea at 20 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.

N₂'P=Urea at 40 lb./ac. of N+20 lb./ac. of P₂O₅ as Super.

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) Nil (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1316
P	1283
N ₁ P	1347
N ₂ P	1334
N ₁ 'P	1344
N ₂ 'P	1307
G.M.	1322
S.E./mean	= 97.3 lb./ac.
No. of experiments	6

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Nilokheri (Punjab).

Type 'M'.

Object :-I (b) (iii) To study different levels and types of N and P.

1. BASAL CONDITIONS

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts-Loam-pH. 7.7. (iii) Nil. (iv) N.A. (v) N.A. (vi) November-December. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

P =20 lb /ac. of P_2O_5 as Super.

N_1P =A/N at 20 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.

N_2P =A/N at 40 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.

N_1^*P =Urea at 20 lb /ac. of N+20 lb./ac. of P_2O_5 as Super.

N_2^*P =Urea at 40 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1637
P	1952
N_1P	1714
N_2P	1459
N_1^*P	1697
N_2^*P	1761
G.M.	1703
S.E./mean	= 102.1 lb./ac.
No. of expts.	3

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Nilokheri (Punjab).

Type :- 'M'.

Object :-II To study the effect of manures (N,P,K).

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts-loam-pH 7.7 (iii) Nil. (iv) N.A. (v) N.A. (vi) November-December. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

N =A/S at 20 lb./ac. of N.

NP =A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

N^*P =A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

N^*P =Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

Fertilisers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1037
N	1302
NP	1496
N'P	1316
N''P	1357
G.M.	1302
S.E./mean	57.6 lb./ac.
No. of expts.	12

Crop :- Wheat. Ref :- Simple trials on cultivators' fields. (T.C.M), 1953.

Centre :- Nilokheri (Punjab.)

Type :- 'M'.

Object :- (IV) (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soil of Indo-Gangetic basin impregnated with salts-Loam-pH.7.7. (iii) Nil. (iv) N.A. (v) N.A. (vi) November-December. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.
 N =A/S at 40 lb./ac. of N
 NP₁ =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.
 NP₂ =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.
 NP'₁ =A/S+Nitro. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.
 NP'₂ =A/S+Nitro. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.
 Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1034
N	1254
NP ₁	1302
NP ₂	1290
NP' ₁	1307
NP' ₂	1362
G.M.	1258
S.E./mean	89.5 lb./ac.
No. of expts.	4

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nilokheri (Punjab). **Type :-** 'M'.

Object :- IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts—loam—pH. 7.7. (iii) Nil. (iv) N.A. (v) N.A. (vi) November-December. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS:

O =Control.

N =A/S at 40 lb./ac. of N.

NP₁ =A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P₂O₅.

NP₂ =A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P₂O₅.

NP₁^r =A/S + Ammo. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP₂^r =A/S + Ammo. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—56. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1041
N	1187
NP ₁	1453
NP ₂	1470
NP ₁ ^r	1405
NP ₂ ^r	1167
G.M.	1287
S.E./mean	= 93.6 lb./ac.
No. of expts.	3

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Nilokheri (Punjab). **Type :-** 'M'.

Object :- IV (v) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts—Loam—pH. 7.7. (iii) Nil. (iv) N.A. (v) November-December. (vi) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

N =A/S at 40 lb./ac. of N.

NP₁^r =A/S+Nitro. phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP₂^r =A/S+Nitro. phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

NP₁^r =A/S+Ammo. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP₂^r =A/S+Ammo. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

Fertilizers applied just before sowing.

3. DESIGN :

(i) & (iii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—56. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1502
N	1504
NP ₁ '	1528
NP ₂ '	1377
NP ₁ "	1561
NP ₂ "	1506
G.M.	1496
S.E./mean	= 109.3 lb./ac.
No. of experiments	3

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Banga (Punjab).

Type :- 'M'.

Object :- (i) (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts, Texture loam—pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N₁ = A/S at 20 lb./ac. of N.

N₂ = A/S at 40 lb./ac. of N.

N₁" = Urea at 20 lb./ac. of N

N₂" = Urea at 40 lb./ac. of N.

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1576
N ₁	1894
N ₂	1973
N ₁ "	1990
N ₂ "	2094
G.M.	1906
S.E./mean	= 34.22 lb/ac.
No. of experiments	27

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Banga (Punjab).

Type :- 'M'.

Object :- II To study the effect of manures (N.P.K.)

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts—Texture loam—pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N = A/S at 20 lb./ac. of N.

NP = A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

N'P = A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

N"P = Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1656
N	1918
NP	2008
N'P	1998
N"P	1948
G.M.	1906
S.E./mean	=39.16 lb./ac.
No. of experiments	28

Crop :-Wheat.

Ref :-Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :-Banga (Punjab).

Type :-'M'.

Object :-IV (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts—Texture loam—pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N = A/S at 40 lb./ac. of N.

NP₁ = A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

NP₂ = A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P_2O_5 .

NP₁' = A/S+Nitro. Phos. at 40 lb./ac. of N+20 lb./ac. of P_2O_5 .

NP₂' = A/S+Nitro. Phos. at 40 lb./ac. of N+40 lb./ac. of P_2O_5 .

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1608
N	1869
NP ₁	1988
NP ₂	2050
NP' ₁	1933
NP' ₂	1971
G.M.	1903
S.E./mean	44.35 lb./ac.
No. of experiments.	13

Crop :-Wheat. Ref :-Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :-Banga (Punjab). Type :-'M'.

Object :-IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts—Texture loam—pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.
 N =A/S at 40 lb./ac. of N
 NP₁ =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.
 NP₂ =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.
 NP₁' =A/S+ Ammo. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅
 NP₂' =A/S+ Ammo. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.
 Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1517
N	1724
NP ₁	1833
NP ₂	1922
NP ₁ ^o	1870
NP ₂ ^o	1878
G.M.	1790
S.E./mean	38.67 lb./ac.
No. of experiments	8

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Banga (Punjab). Type :- 'M'.

Object :-IV (v) To study the effect of sources and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts-Texture loam-pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O=Control.

N=A/S at 40 lb./ac. of N.

NP₁'=A/S+Nitro. phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP₂'=A/S+Nitro. phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

NP₁^o=A/S+Ammono. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP₂^o=A/S+Ammono. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

Fertilizers were applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatments	Av. yield of grain in lb./ac.
O	1414
N	1712
NP ₁ '	1758
NP ₂ '	1810
NP ₁ ^o	1883
NP ₂ ^o	2018
G.M.	1766
S.E./mean	= 43.53 lb./ac.
No. of experiments	= 10

Crop :- Wheat (*Rabi*).

Ref :- Pb. 53(176).

Site :- Patiala.

Type :- 'M'.

Object :- To draw manurial schedule or Wheat crop most suited to Patiala Tehsil.

1. BASAL CONDITIONS

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Loamy for villages Gobindpur, Alampur, Bhunerheri, (one cultivator) Fatehpur (one cultivator); loamy sand for Upli, Bhunerheri, (one cultivator) Majal Khurd (one cultivator), Shekhpur and Uchagaon clayey for Fatehpur and Majal Khurd (one cultivator each). (iii) Nil. (iv) Local for villages Gobindpur, and for one cultivator each for Bhunerheri, Majal Khurd and Shekhpur. Improved for villages Upli, Fatehpur, Alampur, Uchagaon, and one cultivator each for villages Bhunerheri, Majal Khurd and Sheikhpur. (v) (a) to (e) Local. (vi) 5.11.1953 to 22.11.1953. (vii) Irrigated. (viii) N.A. (ix) Approx 6 24" in Patiala Tehsil. (x) 14.4.1954 to 24.4.1954.

2. TREATMENTS :

1. Control (no manure).
 2. A/S at 25 lb./ac. of N.
 3. A/S at 50 lb./ac. of N.
 4. A/S at 25 lb./ac. of N+Super at 25 lb./ac. of P_2O_5 .
 5. A/S at 50 lb./ac. of N+Super at 25 lb./ac. of P_2O_5 .
- Super drilled 3"—4" deep while $\frac{1}{2}$ A/S at sowing time by broadcast and $\frac{1}{2}$ A/S with 1st irrigation.

3. DESIGN :

(i) and (ii) Replications :—One for each cultivator or 16 for tehsil i.e. whole experiment. Eight villages were selected in Patiala Tehsil and in each village two cultivators were selected. (iii) (a) N.A. (b) 1/50 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Height of plants, no of tillers/plant. length of spikes, and grain yield/plot. (iv) (a) 1953—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS :

- (i) 1732 lb./ac.
- (ii) 170.3 lb./ac.
- (iii) Villages, experiments within villages as well as treatments all are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1513
2.	1686
3.	1778
4.	1883
5.	1880
S.E./mean	=42.6 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 53(192).

Site :- Rajpura. Distt. Patiala.

Type :- 'M'.

Object :- To draw manurial schedule for Wheat crop most suited to Rajpura Tehsil.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) Nil. (ii) Loamy in both cultivator's fields : Hasimpur, Sandy loamy in both cultivator's fields in village Chatar Nagar, Heavy clayey in both cultivator's fields in villages Gadapur; Loam to sandy loam in both cultivator's fields in village Ugana, For village Khanpur Gandian N.A. Sandy loam for Kami Kalan, Ghazipur and Alampur (one cultivator each). Clayey for Kami Kalan (one cultivator). Loamy for Alampur (one cultivator). (iii) Nil (iv) Improved for Chater Nagar, Hasimpur, Kami Kalan, Ugana, and Khanpur Gandian (both cultivators' fields). Improved for Gadapur and Alampur (one cultivator field). Local for Ghazipur, Gadapur and Alampur (one cultivator field). (v) (a) to (e) Local. (vi) 14.11.1953 to 3.12.1953. (vii) Irrigated. (viii) N.A. (ix) Approx 6.57" in Rajpura Tehsil. (x) 14.4.1954 to 27.4.1954.

2. TREATMENTS :

1. Control.
2. A/S at 25 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. A/S at 25 lb./ac. of N+Super at 25 lb./ac. of P_2O_5 .
5. A/S at 50 lb./ac. of N+Super at 25 lb./ac. of P_2O_5 .

Super drilled 3"-4" deep and $\frac{1}{2}$ A/S at sowing time by broadcast and $\frac{1}{2}$ A/S with 1st irrigation.

3. DESIGN :

(i) and (ii) 8 villages selected in Rajpura tehsil and 2 cultivators in each village were selected. Replication : 1 on each of cultivators' field. For tehsil 16 replications. (iii) (a) N.A. (b) 1/50th ac. Dimension N.A. (iv) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height of plants, no. of tillers/plant, length of spikes and grain yield/plot. (iv) (a) 1953—contd. (b) N.A. (v) Nil. (vi) One experiment in Ghazipur village rejected.

5. RESULTS :

- (i) 1369 lb./ac.
- (ii) 217.8 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1134
2.	1327
3.	1449
4.	1448
5.	1486
S.E/mean	= 56.2 lb./ac.

Crop :-Wheat (*Rabi*).

Site :-Sirhind.

Ref :-Pb. 53(207).

Type :-'M'.

Object :-To draw maorial schedule for Wheat crop in Sirhind Tehsil.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) and (c) Nil. (ii) Loamy except the cultivator's field in Bajidpur where it is clayey. (iii) Nil. (iv) Improved. (v) (a) to (e) Local. (vi) 5.11.1953 to 29.11.1953. (vii) Irrigated. (viii) N.A. (ix) Approx. 6.30" in Sirhind. (x) 12.4.1954 to 25.4.1954.

2. TREATMENTS :

1. Control.
 2. A/S at 25 lb./ac. of N.
 3. A/S at 50 lb./ac. of N.
 4. A/S at 25 lb./ac. of N and Super at 25 lb./ac. of P_2O_5 .
 5. A/S at 50 lb./ac. of N and Super at 25 lb./ac. of P_2O_5 .
- Super drilled 3"-4" deep and $\frac{1}{2}$ A/S at sowing by broadcast and $\frac{1}{2}$ A/S with 1st irrigation.

3. DESIGN :

(i) and (ii) 8 villages selected in Sirhind and 2 cultivators in each village were selected No. of replications one on each of cultivator's field i.e. 16 in the whole Sirhind. (iii) (a) N.A. (b) 1/50th ac. demension N.A. (iv) Yes.

4. GENERAL :

(i) Crop lodged heavily in all plots. (ii) Nil. (iii) Av. height of plants, no. of tillers/plot, length of spikes and grain yield/plot. (iv) (a) 1953—contd. (b) N.A. (v) Nil. (vi) One experiment in each of village Chararthal Kalan, Kukar Majre and Saurte were rejected for defective layouts etc.

5. RESULTS :

- (i) 1760 lb./ac.
 (ii) 265.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1440
2.	1733
3.	1752
4.	1938
5.	1937
S.E./mean	=73.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 52 (72).

Site :- Nabha. (District Patiala.)

Type :- 'M'.

Object :- To find the suitable treatment combination of N and P_2O_5 on cultivators' fields.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Maize in one and cotton in the other. (c) Nil. (ii) Heavy loam. (iii) Nil. (iv) C-591 (Improved). (v) (a) to (e) 2 plougings and 1 *sohaga*. 1 md./ac. (vi) 13.11.1952 and 24.11.1952. (vii) Irrigated. (viii) N.A. (ix) 2.45". (x) 1st week of April 1953 to 10.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

Super drilled 3" deep before sowing and A/S half dose at sowing and half on 20.12.1952.

3. DESIGN :

(i) and (ii) Fact. in R.B.D. 4 fields in each of the two villages. (iii) (a) 49.5' × 22' (b) 40.33' × 18' (iv) Yes.

4. GENERAL :

(i) Good. Crop lodged in two plots in replication 2. (ii) N.A. (iii) Grain yield/plot. (iv) Not contd. (v) Nil. (vi) Experiment conducted into two villages.

5. RESULTS :

- (i) 1346 lb./ac.
 (ii) 212.4 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1112	1102	951	1055
N_1	1528	1441	1443	1471
N_2	1527	1386	1627	1513
Mean	1389	1310	1340	1346
S.E. of any marginal mean			=43.4 lb./ac.	
S.E. of body of table			=75.1 lb./ac.	

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Nawanshar (Punjab).

Type :- 'M'.

Object :- I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts. Texture : Loam-pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control

N₁ = A/S at 20 lb./ac. of N.

N₂ = A/S at 40 lb./ac. of N.

N₁^u = Urea at 20 lb./ac. of N.

N₂^u = Urea at 40 lb./ac. of N.

Fertilizers drilled at the time of sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) N.A. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1391
N ₁	1773
N ₂	2068
N ₁ ^u	1581
N ₂ ^u	1782
G.M.	1719
S.E./mean	= 37.52
No. of experiments	24

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Nawanshar Punjab.

Type :- 'M'.

Object :- II To study the effect of manures (N, P).

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts. Texture : Loam-pH. 8.0. (iii) Nil (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N = A/S at 20 lb./ac. of N.

NP = A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

N^uP = A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

N^uP = Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

Fertilizers drilled at the time of sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1515
N	1954
NP	2142
N'P	1965
N''P	1906
G.M.	1897
S.E./mean	= 50.68 lb./ac.
No. of experiments	23

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Nawanshar (Punjab).

Type :- 'M'.

Object :- (IV) (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts. Texture : Loam-pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N = A/S at 40 lb./ac. of N.

NP₁ = A/S at 40 lb./ac. of N+St per at 20 lb./ac. of P₂O₅.

NP₂ = A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.

NP₁' = A/S+Nitro. Phos. at 40 lb./ac. of N+20 lb./ac. of P₄O₅.

NP₂' = A/S+Nitro. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

Fertilizers drilled at the time of sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1604
N	2143
NP ₁	2391
NP ₂	2196
NP ₁ '	2162
NP ₂ '	2321
G.M.	2136
S.E./mean	= 119.9 lb./ac.
No. of experiments	8

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M), 1953.

Centre :- Nawanshar (Punjab).

Type :- 'M'.

Object :- (IV) (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soil of Indo-Gangetic basin impregnated with salts. Texture : Loam-pH. 8.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N = A/S at 40 lb./ac. of N.

NP₁ = A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

NP₂ = A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.

NP'₁ = A/S+ Ammo. Phos. at 40 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

NP'₂ = A/S+ Ammo. Phos. at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.

Fertilizers drilled at the time of sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unrepeated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—55. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1641
N	2304
NP ₁	2552
NP ₂	2668
NP' ₁	2482
NP' ₂	2454
G.M.	2350
S.E./mean	= 78.74 lb./ac.
No. of experiments	8

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M), 1953.

Centre :- Nawanshar (Punjab).

Type :- 'M'.

Object :- (IV) (v) To study the effect of sources and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Grey and brown soils of Indo-Gangetic basin impregnated with salts. Texture : Loam-pH.8.0 (iii) Nil. (iv) N.A. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS

O = Control.

N = A/S at 40 lb./ac.

NP'₁ = A/S+Nitro. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP'₂ = A/S+Nitro. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

NP'₁ = A/S+ Ammo. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP'₂ = A/S+ Ammo. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

Fertilizers applied just before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected—Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1558
N	1962
NP ₁	2039
NP ₂	2049
NP ₁	2138
NP ₂	2134
G.M.	1980
S E/mean	= 99.56 lb./ac.
No. of expts	8

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Bhadson (Pepsu).

Type :- 'M.

Object : I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Alluvial—sandy to clay loam—pH. 8.6. (iii) Nil. (iv) Improved variety C—591. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O = Control.

N₁ = A/S at 20 lb./ac. of N.

N₂ = A/S at 40 lb./ac. of N.

N₁^u = Urea at 20 lb./ac. of N.

N₂^u = Urea at 40 lb./ac. of N.

Fertilizers were broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatments	Av. yield of grain in lb./ac.
O	1245
N ₁	1463
N ₂	1567
N ₁ ^u	1431
N ₂ ^u	1575
G.M.	1456
S.E./mean	= 58.17 lb./ac.
No of the experiments	16

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Bhadson (Pepsu).

Type :- 'M'.

Object :-I (b) (ii) To study different levels and types of N and P.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Alluvial—sandy to clay loam—pH. 8.6. (iii) Nil. (iv) Improved variety C—591. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS:

O =Control.

P =20 lb /ac. of P_2O_5 as Super.

N_1P =A/S at 20 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.

N_2P =A/S + 40 lb /ac. of N+20 lb./ac. of P_2O_5 as Super.

N_1^*P =Urea at 20 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.

N_2^*P =Urea at 40 lb./ac. of N+20 lb./ac. of P_2O_5 as Super.

Nitrogenous fertilizers broadcast before sowing while phosphatic fertilizers were drilled at sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1325
P	1507
N_1P	1688
N_2P	1691
N_1^*P	1677
N_2^*P	1716
G.M.	1600
S.E./mean	=49.12 lb./ac.
No. of the experiments	34

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Bhadson (Pepsu).

Type :- 'M'.

Object :-II To study the effect of manures (N, P and K).

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Alluvial—sandy to clay loam—pH. 8.6. (iii) Nil. (iv) Improved variety C—591. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

N =A/S at 20 lb./ac. of N.

NP =A/S at 20 lb./ac. of N + Super at 20 lb./ac. of P_2O_5 .

N^*P =A/N at 20 lb./ac. of N +Super at 20 lb./ac. of P_2O_5 .

N^*P =Urea at 20 lb./ac. of N +Super at 20 lb./ac. of P_2O_5 .

Nitrogenous fertilizers broadcast before sowing while phosphatic fertilizers were drilled at sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1372
N	1519
NP	1662
N ^o P	—
N ^o P	1658
G.M.	1553
S.E./mean	=35.87 lb./ac.
No. of the expts.	50

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Bhadson (Pepsu).

Type :- 'M'.

Object :-IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Alluvial—sandy to clay loam—pH. 8.6. (iii) Nil. (iv) Improved variety C-591. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

N =A/S at 40 lb./ac. of N.

NP₁ =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

NP₂ =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅

NP₁^o =A/S+ Ammo. Phos. at 40 lb./ac. of N + Super at 20 lb./ac. of P₂O₅,

NP₂^o =A/S+ Ammo. Phos. at 40 lb./ac. of N + Super at 40 lb./ac. of P₂O₅.

Nitrogenous and Potash fertilizers broadcast before sowing while phosphatic fertilizer were drilled at sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

Treatments	Av. yield of grain in lb./ac.
O	1584
N	1697
NP ₁	1777
NP ₂	1804
NP ₁ ^o	1809
NP ₂ ^o	1874
G.M.	1758
S.E./mean	= 61.55 lb./ac.
No. of experiments	16

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Bhadson (Pepsu).

Type :- 'M'.

Object :-IV (i) To study the effects of the types and levels of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Alluvial-sandy to clay loam-pH. 8.6. (iii) Nil. (iv) Improved variety C-591. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

N =A/S at 40 lb./ac. of N.

NP₁ =A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P₂O₅

NP₂ =A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅.

NP'₁ =A/S+Nitro. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP'₂ =A/S+Nitro. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

Nitrogenous fertilizers were broadcast before sowing, while phosphatic fertilizers were drilled at sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1452
N	1916
NP ₁	1819
NP ₂	1994
NP' ₁	1811
NP' ₂	1903
G.M.	1816
S.E./mean	= 81.29 lb./ac.
No. of expt.	16

Crop :- Wheat. **Ref :-** Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Bhadson (Pepsu).

Type :- 'M'.

Object :-IV (v) To study the effect of different levels and sources of P and N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Alluvial-sandy to clay loam-pH. 8.6. (iii) Nil. (iv) Improved variety C-591. (v) N.A. (vi) November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April.

2. TREATMENTS :

O =Control.

N =A/S at 40 lb./ac. of N.

NP'₁ =A/S+Nitro. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP'₂ =A/S+Nitro. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

NP''₁ =A/S+Ammono. Phos. at 40 lb./ac. of N+20 lb./ac. of P₂O₅.

NP''₂ =A/S+Ammono. Phos. at 40 lb./ac. of N+40 lb./ac. of P₂O₅.

DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield of grain in lb./ac.
O	1403
N	1570
NP ₁	1860
NP ₂	1723
NP ₁	1730
NP ₂	1730
G.M.	1669
S.E./mean	= 73.97 lb./ac.
No. of experiments	18

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49(11).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'MV'.

Object :- To study the effect of N on yield of two Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9 and 10.11.1949. (iv) (a) 1 *hindustan*, 5 *desi* ploughing and 5 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) 7.52". (x) 8.5.1950.

2. TREATMENTS :**Main-plot treatments :**

7 levels of N : N₀=0, N₁=F.Y.M. at 25 lb./ac. of N, N₂=F.Y.M. at 50 lb./ac. of N, N₃=A/S at 25 lb./ac. of N, N₄=A/S at 50 lb./ac. of N, N₅=Ammono. Phos. at 25 lb./ac. of N and N₆=Ammono. Phos. at 50 lb./ac. of N.

Sub-plot treatments :

2 varieties : V₁=C—591 (medium) and V₂=C—518 (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 100'10" × 6'9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory, growth normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951 with modification. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Experiment for the year 1948 purely manurial.

5. RESULTS :

(i) 2152 lb./ac.
 (ii) (a) 194.8 lb./ac.
 (b) 206.0 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	Mean
V ₁	2102	2123	1991	2168	2302	2205	2176	2152
V ₂	2119	2275	2061	2156	2045	2164	2246	2152
Mean	2111	2199	2026	2162	2173	2185	2211	2152

S.E. of difference of two

1. N marginal means = 97.4 lb./ac.
2. V marginal means = 55.1 lb./ac.
3. V means at the same level of N = 145.7 lb./ac.
4. N means at the same level of V = 141.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 50(12).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'MV'.

Object :- To study the effect of N on yield of two Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize for fodder. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.11.1950. (iv) (a) 1 *raja* plough, 5 *desi hal* and 7 *sohaga*. (b) N.A. (c) 30 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) As under treatments. (vii) Irrigated. (viii) One weeding. (ix) 4.86". (x) 17.5.1951.

2. TREATMENTS :

Main-plot treatments :

7 levels of N : N₀=Control, N₁=F.Y.M. at 25 lb./ac. of N, N₂=F.Y.M. at 50 lb./ac. of N, N₃=A/S at 25 lb./ac. of N, N₄=A/S at 50 lb./ac. of N, N₅=Ammo. Phos. at 25 lb./ac. of N and N₆=Ammo. Phos. at 50 lb./ac. of N

Sub-plot treatments :

2 varieties : V₁=C-591 (medium) and V₂=C-518 (medium).

A/S and Ammo. Phos. applied on 14.12.1950, F.Y.M. applied on 12.11.1950.

3. DESIGN :

(i) Split-plot design. (ii) (a) 7 main-plots/block ; 2 sub-plots/main-plot. (iii) 4. (iv) (a) 15½' × 81' = 1/35 ac. (b) 6' × 75' - 7½" = 1/96th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory, growth normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2012 lb./ac.
- (ii) (a) 401.4 lb./ac.
- (b) 282.7 lb./ac.
- (iii) None of the effects is significant.
- (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	Mean
V ₁	1913	1601	1685	2083	2206	2098	2191	1968
V ₂	1691	1867	2138	2277	2154	2061	2194	2055
Mean	1802	1734	1912	2180	2180	2080	2193	2012

S.E. of difference of two

1. N marginal means = 200.7 lb./ac.
2. V marginal means = 75.6 lb./ac.
3. V means at the same level of N = 199.9 lb./ac.
4. N means at the same level of V = 245.5 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 51(74).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'MV'.

Object :- To study the effect of N on yield of two Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.11.1951. (iv) (a) 1 *raja*, 4 *desi* and 6 *sohaga*. (b) N.A. (c) N.A. (d) 6" row to row. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) One weeding. (ix) 8.54". (x) 21 and 22.4.1952.

2. TREATMENTS :

Main-plot treatments :

7 levels of N : N_0 =Control (no manure), N_1 =F.Y.M. at 25 lb./ac. of N, N_2 =F.Y.M. at 50 lb./ac. of N, N_3 =A/S at 25 lb./ac. of N, N_4 =A/S at 50 lb./ac. of N, N_5 =Ammono. Phos. at 25 lb./ac. of N and N_6 =Ammono. Phos. at 50 lb./ac. of N.

Sub-plot treatments :

2 varieties : V_1 =C-591 (medium) and V_2 =C-518 (medium).
F.Y.M. applied on 16.11.1951. A/S and Ammono. Phos. applied on 22.12.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 7 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1876 lb./ac.
(ii) (a) 481.7 lb./ac.
(b) 296.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	N_6	Mean
V_1	1738	1743	1692	1941	1815	1959	1913	1829
V_2	1911	1705	1461	1931	1990	2281	2178	1922
Mean	1825	1724	1577	1936	1903	2120	2046	1876

S.E. of difference of two

- | | |
|-----------------------------------|----------------|
| 1. N marginal means | =240.9 lb./ac. |
| 2. V marginal means | =79.3 lb./ac. |
| 3. V means at the same level of N | =209.8 lb./ac. |
| 4. N means at the same level of V | =282.9 lb./ac. |

Crop :- Wheat.

Ref :- Pb. 48(40).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'C'.

Object :- To study the effect of operations done on Wheat after sowing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 30.10.1948. (iv) (a) and (b) N.A. (c) 1 sr. 2 *chk.*/plot. (d) and (e) N.A. (v) N.A. (vi) C-228 (medium). (vii) Irrigated. (viii) Nil. (ix) 7.68". (x) 18.4.1949.

2. TREATMENTS :

1. Control (*pore*).
2. *Sohaga* after *pore*.
3. Roller after *pore*.
4. *Sohaga* + Roller after *pore*.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 18½' × 117.7'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1946—48. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 742.2 lb./ac.
- (ii) 82.2 lb./ac.
- (iii) The treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	781.7
2.	769.2
3.	699.8
4.	718.1
S.E./mean	= 29.1 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(63).

Site :- Distt. and Demonstration Farm, Ambala.

Type 'C'.

Object :- To study the effect of different intensities of cultivation with local and indigeneous implements on Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 6,7.11.1948. (iv) (a) As per treatments. (b) N.A. (c) 3½ sr./plot. (d) and (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 7.68". (x) 19.4.1949.

2. TREATMENTS :

1. Improved high—1 *raja* +2 *desi*+2 horse hoe.
2. Improved low—1 *raja* +2 *desi*
3. Improved medium—1 *raja* +2 *desi*+1 horse hoe.
4. Local high—5 *desi*.
5. Local low—2 *desi*.
6. Local medium—3 *desi*.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 1/10th ac. (b) 1/10th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1067 lb./ac.
- (ii) 211.7 lb./ac.
- (iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1191
2.	892
3.	1113
4.	1207
5.	990
6.	1011
S.E./mean	= 86.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(48).

Site :- Govt. Agri. Stn., Gurdaspur.

Type 'C',

Object :—To study the effect of late and dry sowing on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fodder—Wheat. (b) Sannhemp. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.12.1952. and 26.12.1952 (iv) (a) 7 ploughings and 10 *sohaga*. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) Sannhemp burried for green manuring on 8.8.1952. (vi) C-228 (late). (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 4.82". (x) 25.4.1953.

2. TREATMENTS :

1. Sowing followed by immediate irrigation on 6.12.1952.
2. Irrigated on 6.12.1952 and sown on 26.12.1952 after the soil was ready.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) 81'×13.5' (b) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1400 lb./ac.
- (ii) 131.2 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1542
2.	1259
S.E./mean	= 46.4 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53 (72).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'C'.

Object :—To find out a suitable seed rate for C-518 variety of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953. (iv) (a) 1 *hindustan* plough, 5 *desi* plough and 7 *sohaga*. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v) Sannhemp burried in the are a for green manuring on 28.8.1953. (vi) C-518 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 23.4.1954.

2. TREATMENTS :

4 seed rates :

1. 24 sr./ac.
2. 32 sr./ac.
3. 40 sr./ac.
4. 48 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 9'×75'-7½". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal except for attack of rust. No lodging. (ii) Badly attacked by all kinds of rust. (iii) Grain yield (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 653.9 lb./ac.
- (ii) 91.93 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	656.2
2.	605.8
3.	715.9
4.	637.7
S.E./mean	= 32.50 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52 (49).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'C'.

Object :—To find out the best spacing for Wheat crop under irrigated conditions.

1. BASAL CONDITIONS :(i) (a) Nil. (b) Maize. (c) 1 C.L. of F.Y.M. on 16.6.1952. (ii) (a) Heavy loam. (b) N.A. (iii) 29.11.1952. (iv) (a) 8 ploughings and 10 *sohoga*. (b) N.A. (c) Approx. one md/ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) C-228 (late). (vii) Irrigated. (viii) 3 weedings and 1 hoeing. (ix) 4.82". (x) 28.4.1953.**2. TREATMENTS :**

1. Spacing between rows 7".
2. Spacing between rows 8".
3. Spacing between rows 9".

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 6'×44'. (b) 6'×33'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1955 (continued with modification till 1955). (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2138 lb./ac.
- (ii) 326.6 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2008
2.	2376
3.	2029
S.E./mean	= 163.3 lb./ac.

Crop :- Wheat.
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 53(73).
Type :- 'C'.

Object :- To study the effect of spacing on yield of Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp for green manuring. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.11.1953. (iv) (a) 1 *hindustan* plough, 4 *desi* plough, 5 *sohaga* and 2 roller (b) to (d) As per treatments. (e) —. (v) Sannhemp buried on 15.8.1953 ; 30 lb./ac. of N as A/S+15 lb./ac. of P_2O_5 as Super broadcast just before sowing. (vi) C-518 (medium). (vii) Irrigated. (viii) Nil. (ix) 10.33" (x) 22.4.1954.

2. TREATMENTS :

1. Spacing 6" from row to row with 48 sr./ac. as seed rate.
2. Spacing 9" from row to row with 32 sr./ac. as seed rate.
3. Spacing 9" from row to row and plant to plant with 48 sr./ac. as seed rate.
Seeds sown in lines behind plough by *kera* in treatments 1 and 2 while sown by dibbling in treatment 3.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 75'.7½" (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 636.3 lb./ac.
(ii) 94.37 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	672.7
2.	608.9
3.	27.4
S.E./mean	= 38.52 lb./ac.

Crop :- Wheat.
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 48(23).
Type :- 'C'.

Object :- To study the effect of cultivation on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam to sandy loam. (b) Refer soil analysis, Jullundur. (iii) 8.11.1948. (iv) (a) As per treatments. (b) N.A. (c) 35 sr./ac. (d) and (e) N.A. (v) 250 lb. of A/S added on 1.12.1948. (vi) N.A. (vii) Irrigated. (viii) One hoeing and 1 topping on 11.1.1949. (ix) 6.29". (x) 17.18.4.1949.

2. TREATMENTS :

1. 1 *hindustan*, 4 *desi* and 5 horse hoe.
2. 2 *hindustan*, 5 *desi* and 8 horse hoe.
3. 10 *desi* ploughings.
4. 15 *desi* ploughings.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 36' x 80'-8". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. Lodging occurred. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1948. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2323 lb./ac.
 (ii) 219.0 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2359
2.	2231
3.	2424
4.	2276
S.E./mean	= 98.0 lb./ac.

Crop :- Wheat.

Site :- Distt. and Demonstration Farm, Kangra.

Ref :- Pb. 53(49).

Type :- 'C'.

Object :—To compare the different methods of sowing Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 12.11.1953. (iv) (a) 3 ploughings and 2 plankings. (b) and (c) As per treatments. (d) 9'×4½". (e) N.A. (v) 60 lb./ac. of N as A/S broadcast. (vi) C-250 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 21.60". (x) 4.5.1954.

2. TREATMENTS :

1. Local method of sowing seed by *kera* (seed rate 1 md./ac.).
 2. 4 seeds sown together at one place (approx seed rate 30 sr./ac.).

3. DESIGN :

- (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 11'×66'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) No. (iii) Grain and *bhusa* yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 678.9 lb./ac.
 (ii) 180.26 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	756.0
2.	601.7
S.E./mean	=104.07 lb./ac.

Crop :- Wheat.

Site :- Cereal Breeding Sub-Stn., Kulu.

Ref :- Pb. 52(26).

Type :- 'C'.

Object :—To find out the optimum seed rate for Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Maize. (b) Maize. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 15.11.1952. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) C-224 (early improved). (vii) Unirrigated. (viii) N.A. (ix) 14.44". (x) N.A.

2. TREATMENTS :

3 seed rates :

1. 40 sr./ac.
2. 50 sr./ac.
3. 60 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) $30\frac{1}{2}' \times 12'$. (b) $30\frac{1}{2}' \times 12'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) N.A. (iii) Grain yield. (iv) (a) 1952-1953 (modified in 1953). (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1656 lb./ac.
- (ii) 499.7 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1693
2.	1601
3.	1674
S.E./mean	= 249.9 lb./ac.

Crop :- Wheat.

Site :- Cereal Breeding Sub-Stn., Kulu.

Ref :- Pb. 53(44).

Type :- 'C'.

Object :—To find out the optimum seed rate for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize. (b) Maize. (c) F.Y.M. applied ; time and amount N.A. (ii) (a) Loam. (b) N.A. (iii) 6.10.1953. (iv) (a) 3 ploughings and 3 plankings. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) No. (vi) C-224 (early improved). (vii) Unirrigated. (viii) N.A. (ix) 20.71%. (x) 2.6.1954.

2. TREATMENTS :

4 seed rate :

1. 30 sr./ac.
2. 35 sr./ac.
3. 40 sr./ac.
4. 45 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) $22' \times 5\frac{1}{2}'$. (v) No. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1953 (modified in 1953.) (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1617 lb./ac.
- (ii) 180.9 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1527
2.	1678
3.	1666
4.	1597
S.E./mean	= 90.5 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(64).

Site :- Agri. Farm, Rohtak.

Type :- 'C'.

Object :—To study the optimum date of sowing for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) N.A. (vi) D—9 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26". (x) 11.4.1949.

2. TREATMENTS :

5 sowing dates : $D_1=10.10.1948$, $D_2=18.10.1948$, $D_3=26.10.1948$, $D_4=3.11.1948$ and $D_5=11.11.1948$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) $66' \times 23'$. (b) $63.5' \times 18'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good, stand and condition poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943 to 1948. (b) No. (c) —. (v) (a) N.A. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 284.9 lb./ac.
 (ii) 72.9 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D_1	226.3
D_2	277.7
D_3	277.7
D_4	313.7
D_5	329.1
S.E./mean	=29.7 lb./ac.

Crop :-Wheat.

Ref :-Pb. 52(41).

Site :-Govt. Agri. Stn., Gurdaspur.

Type :-'CV'.

Object :—To study the effect of different seed rates with various varieties on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 11.11.1952. (iv) (a) 3 ploughings and 4 *sohaga*. (b) *Kera* behind the plough. (c) As per treatments. (d) 9" row to row. (e) —. (v) 8 C.L. of F.Y.M. given to the whole experimental area one month before sowing by broadcast. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 4.82". (x) 19.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 varieties : $V_1=C-518$ (medium), $V_2=C-591$ (medium) and $V_3=C-250$ (medium).
 (2) 3 seed rates : $R_1=24$ sr./ac., $R_2=28$ sr./ac. and $R_3=32$ sr./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $81' \times 9\frac{1}{2}'$. (b) $73.3' \times 8\frac{1}{2}'$. (v) $\frac{1}{2}$ ' along the breadth and approx. 4' along the length including channel. (vi) $\frac{1}{2}$ Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Nil.

5. RESULTS

- (i) 2630 lb./ac.
(ii) 209.6 lb./ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	Mean
V ₁	2985	2818	2854	2886
V ₂	2582	2522	2473	2526
V ₃	2409	2473	2550	2477
Mean	2659	2604	2626	2630

S.E. of any marginal mean = 49.4 lb./ac.
S.E. of body of table = 85.6 lb./ac.

Crop :-Wheat.

Site :-Govt. Agri. Stn., Gurdaspur.

Ref :-Pb. 53(70).

Type :-'CV'.

Object :-To study the effect of different seed rates and varieties on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton and fallow. (Nearly half portion was fallow and half cotton). (c) 10 sr./ac. of A/S to cotton portion. (ii) (a) Light loam. (b) N.A. (iii) 27.11.1953. (iv) (a) 6 ploughings by *desi* plough, and 10 *sohaga*. (b) N.A. (c) As per treatments. (d) 9' row to row. (e) N.A. (v) 1 md. and 28 sr. of super by broadcast just before sowing and 25 sr. of A/S on 6.1.1954. by broadcast. (vi) As per treatments. (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 26.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 seed rates : R₁=24 sr./ac., R₂=32 sr./ac. and R₃=40 sr./ac.

(2) 2 varieties : V₁=C-591 (medium) and V₂=C-250 (medium).

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 81'×12'. (b) 75.5'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1416 lb./ac.
(ii) 111.9 lb./ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	Mean
V ₁	1146	1128	1243	1172
V ₂	1657	1710	1613	1660
Mean	1402	1419	1428	1416

S.E. of marginal mean of R = 61.2 lb./ac.
S.E. of marginal mean of V = 49.9 lb./ac.
S.E. of body of table = 86.5 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48 (13).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'CV'.

Object :- To find out best sowing date for different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Water-melon. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 7 *desi* ploughings, 2 horse hoe, 8 *sohaga* and 1 barharrow. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) A/S at 3 md./ac. applied to D₁, D₂ and D₃ plots on 18.12.1948 and to D₄ plots on 12.1.1949. (vi) As per treatments. (vii) Irrigated. (viii) One hoeing. (ix) 6.29". (v) D₁ and D₂ 10, 12.9.1949; D₃ 14.4.1949 and D₄ 20, 21.4.1949.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing: D₁=15.10.1948, D₂=30.10.1948, D₃=15.11.1948 and D₄=1.12.1948.

Sub-plot treatments :

2 varieties: V₁=C-591 and V₂=C-228.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 12.75' x 43.80'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Very good germination. Crop lodged. (ii) Attack of yellow rust was very severe. (iii) Grain and straw yield. (iv) (a) 1946 to 1948. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2087 lb./ac.

(ii) (a) 364.1 lb./ac.

(b) 199.9 lb./ac.

(iii) Both D and V effects are highly significant. Interaction D x V is not significant.

(iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	2071	2243	2068	1402	1946
V ₂	2505	2522	2205	1676	2227
Mean	2288	2383	2137	1539	2087

S.E. of difference of two

1. D marginal means = 148.6 lb./ac.

2. V marginal means = 57.7 lb./ac.

3. V means at the same level of D = 115.4 lb./ac.

4. D means at the same level of V = 169.6 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48 (41).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'

Object :- To study the effect of different intensities of cultivation in presence of different hoeings and at two levels of N.

2. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 9.11.1948. (iv) (a) As per treatments. (b) N.A. (c) 35 sr./ac. (d) N.A. (e) N.A. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 7.68". (x) 15.4.1949.

2. TREATMENTS

Main-plot treatments :

Ploughings : $R_1=2$ *raja* and 10 *desi* ploughings and $R_2=2$ *raja* and 16 *desi* ploughings.

Sub-plot treatments :

All combinations of (1) and (2)

(1) Hoings : $H_1=1$ and $H_2=3$ hoings.

(2) Levels of N as A/S : $N_1=40$ and $N_2=80$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60.5'×18'. (b) 60.5'×18'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1903 lb./ac.
 (ii) (a) 983.8 lb./ac.
 (b) 180.5 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	H_1	H_2	Mean	N_1	N_2
R_1	1893	1869	1881	1857	1905
R_2	1934	1915	1925	1929	1921
Mean	1914	1892	1903	1893	1913
N_1	1942	1844			
N_2	1885	1941			

S.E. of marginal mean of N or H	= 45.1 lb./ac.
S.E. of body of N×H table	= 63.8 lb./ac.
S.E. of difference of two	
1. P marginal means	=241.7 lb./ac.
2. N or H means at the same level of P	= 90.3 lb./ac.
3. P means at the same level of N or H	=250.0 lb./ac.

Crop :- Wheat.

Ref :- Pb. 49(72).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'.

Object :- To study the effect of manure and hoings on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 14.11.1949. (iv) (a) and (b) N.A. (c) 36 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 5.33%. (x) 21.4.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of hoeing : $H_1=1$ and $H_2=3$ hoings.

(2) 2 levels of N as A/S : $N_1=40$ lb. and $N_2=80$ lb./ac.

A/S applied $\frac{1}{2}$ on 11.11.1949 and $\frac{1}{2}$ on 22.1.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $14' \times 103'-3"$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1412 lb./ac.
 (ii) 115.9 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	Mean
H ₁	1303	1552	1428
H ₂	1289	1503	1396
Mean	1296	1528	1412

S.E. of any marginal mean = 33.4 lb./ac.
 S.E. of body of table = 47.3 lb./ac.

Crop :- Wheat.

Ref :- Pb. 50(81).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'.

Object :—To study the effect of manures and hoeings on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) 6.11.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) C-691 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 2.88". (x) 19.4.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of hoeing : H₁=One hoeing and H₂=3 hoeings.
 (2) 2 levels of N as A/S : N₁=40 and N₂=80 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) $13' \times 69.8'$. (b) $13' \times 69.8'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1952. (b) No. (c)—. (v) (a) No (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1143 lb./ac.
 (ii) 130.8 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	Mean
H ₁	1021	1200	1110
H ₂	1048	1304	1176
Mean	1034	1252	1143

S.E. of any marginal mean = 32.7 lb./ac.
 S.E. of body of table = 46.2 lb./ac.

Crop :- Wheat.

Ref :- Pb. 51 (119).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'.

Object :—To study the effect of manures and hoeings on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 7.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 10.20". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of hoeing : H_1 =one hoeing and H_2 =3 hoeings.(2) 2 levels of N as A/S : N_1 =40 and N_2 =80 lb./ac.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 1/48 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair, No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1952. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1828 lb./ac.

(ii) 151.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N_1	N_2	Mean
H_1	1850	1803	1826
H_2	1858	1803	1830
Mean	1854	1803	1828

S.E. of any marginal mean = 37.8 lb./ac.

S.E. of body of table = 53.4 lb./ac.

Crop :- Wheat.

Ref :- Pb. 52(153).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'.

Object :—To study the effect of manures and hoeings on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy clayey loam. (b) N.A. (iii) 26.10.1952. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C—591 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 14.20". (x) 26.10.1952.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 levels of hoeing : H_1 =1 and H_2 =3 hoeings.(2) 2 levels of N as A/S : N_1 =40 and N_2 =80 lb./ac. $\frac{1}{2}$ N applied on 26.10.52 and applied on 24.12.1952.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 13'×69.8'. (b) 13'×69.8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Straw and grain yield. (iv) (a) 1949 to 1952. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 989 lb./ac.
 (ii) 171.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	Mean
H ₁	881	947	914
H ₂	1038	1089	1064
Mean	960	1018	989

S.E. of any marginal mean = 49.5 lb./ac.
 S.E. of body of table = 70.1 lb./ac.

Crop :-Wheat

Site :-Jullundur Agri. Stn., Jullundur.

Ref :-Pb. 53(93).

Type :-'CM'.

Object :—To study the effect of seed rate, spacings and levels of N on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Guara* (Green manuring). (c) Nil. (ii) (a) Medium to heavy loam. (b) Refer soil analysis, Jullundur. (iii) 13.11.1953. (iv) (a) *Raja* plough, 4 *desi hal* and 2 *sohaga*. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) *Guara* buried on 5.9.1953. (vi) C-518 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 10.33". (x) 25.4.1954.

2. TREATMENTS :

All possible combinations of (1), (2), (3), (4) and one extra treatment.

1. 2 spacings : S₁=6" and S₂=9".
 2. 2 seed rates : R₁=32 sr./ac. and R₂=40 sr./ac.
 3. 2 levels of N as A/S : N₁=40 lb./ac. and N₂=60 lb./ac.
 4. 2 levels of P₂O₅ as Super : P₁=25 lb./ac. and P₂=40 lb./ac.

A/S and Super applied before sowing on 12.11.1953 by broadcast.

Extra treatment : S₂R₂=Spacing 9" with 40 sr./ac. of seed rate and no manure applied.

3. DESIGN :

- (i) R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 53'×10'. (b) 45.4'×8'. (v) One foot from breadth side and 3.8' from length side as non-experimental. (vi) Yes.

4. GENERAL :

- (i) Fair to good. Crop slightly lodged. (ii) Rust attack. (iii) Grain yield. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 897.3 lb./ac.
 (ii) 184.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield.
S ₂ R ₂	1164	S ₂ R ₁ N ₁ P ₁	763
S ₁ R ₁ N ₁ P ₁	756	S ₂ R ₁ N ₁ P ₂	852
S ₁ R ₁ N ₁ P ₂	964	S ₂ R ₁ N ₂ P ₁	987
S ₁ R ₁ N ₂ P ₁	756	S ₂ R ₁ N ₂ P ₂	848
S ₁ R ₁ N ₂ P ₂	960	S ₂ R ₂ N ₁ P ₁	887
S ₁ R ₂ N ₁ P ₁	1045	S ₂ R ₂ N ₁ P ₂	887
S ₁ R ₂ N ₁ P ₂	894	S ₂ R ₂ N ₂ P ₁	910
S ₁ R ₂ N ₂ P ₁	771	S ₂ R ₂ N ₂ P ₂	968
S ₁ R ₂ N ₂ P ₂	844		
	S.E./mean		=92.3 lb./ac.

Crop :-Wheat.

Ref :-Pb. 50(16).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'CM'.

Object :—To study the residual effect of manures applied to previous Maize crop on following Wheat crop with varying spacing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1950. (iv) (a) 1 raja, 4 desi hal and 5 sohaga. (b) N.A. (c) 36 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 5.19". (x) 22.4.1951.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 plant to row spacings : $S_1=9"$, $S_2=12"$ and $S_3=15"$.(2) 2 row to row spacings : $R_1=1'$ and $R_2=1\frac{1}{2}'$.

Sub-plot treatments :

4 levels of N as A/S : $N_0=0$, $N_1=50$, $N_2=100$ and $N_3=150$ lb./ac.

N applied to previous Maize crop.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $8' \times 63'$. (b) $8' \times 56.72'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) —. (c) —. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2514 lb./ac.

(ii) 301.1 lb./ac.

(iii) Only N effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	Mean	R_1	R_2
S_1	2305	2450	2512	2925	2548	2513	2583
S_2	2239	2297	2510	2953	2500	2492	2508
S_3	2368	2484	2496	2989	2584	2599	2570
Mean	2304	2410	2506	2956	2544		
R_1	2299	2432	2458	2980	2535		
R_2	2309	2419	2554	2931	2553		

S.E. of marginal mean of S =53.2 lb./ac.

S.E. of marginal mean of R =43.5 lb./ac.

S.E. of body of table S × R =75.3 lb./ac.

S.E. of difference of two

1. N marginal means =43.1 lb./ac.

2. N means at the same level of S =74.7 lb./ac.

3. S means at the same level of N =99.2 lb./ac.

4. N means at the same level of R =61.0 lb./ac.

5. R means at the same level of N =81.0 lb./ac.

Crop :- Wheat.

Ref :- Pb. 48(15).

Site :- Jullundur Agri. Stn., Jullundur

Type :- 'I'.

Object :—To study the effect of irrigation on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (G.M.). (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.11.1948. (iv) (a) 1 *raja*, 6 *desi*, 2 horse hoe, 7 *sohaga* and bar-harrow. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) N.A. (vi) C-591 (medium) (vi) Irrigated. (viii) Nil. (ix) 6.29°. (x) 13.4.1949.

2. TREATMENTS

1. 2 irrigation.
2. 3 irrigation.
3. 4 irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 19.5'×46.51'. (v) No. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Slight attack of yellow rust. (iii) Grain and straw yield. (iv) (a) 1946—49. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1975 lb./ac.
 (ii) 138.2 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1907
2.	1953
3.	2066
S.E./mean	=56.4 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- Pb. 49 (27)

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'I'.

Object :—To study the effect of irrigation on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (G.M.). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.11.1949. (iv) (a) 4 *desi hal*, 6 *sohaga* and 1 roller. (b) N.A. (c) 30 sr./ac. (d) and (e) N.A. (v) Previous crop *guara* was green manured by burying in the field. (vi) C-591 (medium). (vii) Irrigated. (viii) One weeding (x) 6.14". (x) 23.4.1950.

2. TREATMENTS :

1. 2 irrigations.
2. 3 irrigations.
3. 4 irrigations.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 1/48 ac. (b) Nil. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1946—49. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2477 lb./ac.
(ii) 138.8 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2363
2.	2448
3.	2620
S.E./mean	= 56.6 lb./ac.

Crop :- Wheat.

Ref :- Pb. 53(69).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'D'.

Object :- To study the effect of different insecticides on the germination, growth and yield of Wheat.

5. BASAL CONDITIONS :

- (i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.11.1953. (iv) (a) 1 *Hindustan* plough, 7 *desi* plough, 12 *sohaga*, 1 roller. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) C-250 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 10.33". (x) 21.4.1954.

2. TREATMENTS :

- Control.
- Anhydrous copper sulphate at 4 oz. per maund of seed.
- Ceresan at 4 oz. per maund of seed.
- Agrosan G.N. at 3 oz. per maund of seed.

Seeds were treated just before sowing with these treatments.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 80' x 12'. (b) 55' x 12'. (v) 10' and 15' left out on two sides of the plots. (vi) Yes.

4. GENERAL :

- (i) Condition satisfactory and growth normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1375 lb./ac.
(ii) 46.7 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1358
2.	1345
3.	1389
4.	1407
S.E./mean	= 19.1 lb./ac.

Crop :- Barley.

Ref :- Pb. 51(1).

Site :- Barley Res. Farm, Gurgaon.

Type :- 'M'.

Object :- To assess the value of N and P₂O₅ fertilizers in relation to grain yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Guara* (Green manure). (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 1.11.1951. (iv) (a) 1 *Hindustan* ploughing and 4 *desi* ploughings, (b) to (e) N.A. (vi) Type 4—(early). (vii) Irrigated. (viii) 2 hoeings and one weeding. (ix) 1.66". (x) 31.3.1952.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $11\frac{1}{2}' \times 66'$. (b) $10' \times 64'$. (v) 2 rows one on each side of plot kept as border. (vi) Yes.

4. GENERAL

(i) Good condition. No lodging. (ii) Nil. (iii) height, ear length, no. of grains per ear head, grain weight. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1450 lb./ac.

(ii) 447.9 lb./ac.

(iii) Only N effect is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	1059	1283	1339	1227
N_1	1301	1648	1540	1496
N_2	1617	1569	1698	1628
Mean	1326	1500	1527	1450

S.E. of marginal means = 105.6 lb./ac.

S.E. of body of table = 182.9 lb./ac.

Crop :- Barley.

Site :- Barley Res. Farm, Gurgaon.

Ref :- Pb. 52(6).

Type :- 'M'.

Object :- To assess the value of N and P_2O_5 fertilizers in relation to grain yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Mung*. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 20.11.1952. (iv) (a) 1 *Hindustan* plough, 4 *desi hal* and 3 *sohaga*. (b) and (c) N.A. (d) 6" row to row. (e) N.A. (v) Nil. (vi) Barley type 4 (Improved and early). (vii) Irrigated. (viii) 3 hoeings and 1 weeding. (ix) 2.27". (x) 2.4.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $66' \times 12\frac{1}{2}'$. (b) $64' \times 11'$. (v) 2 rows on each side of the plot left out as border. (vi) Yes.

4. GENERAL:

(i) Stand of crop good. No lodging. (ii) No. (iii) Height, ear length, no. of grains per ear and grain weight. (iv) (a) Yes. 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 2438 lb./ac.

(ii) 262.4 lb./ac.

(iii) N effect is highly significant while P effect is significant.

(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	2246	2416	2077	2246
N ₁	2608	2561	2503	2557
N ₂	2652	2604	2275	2510
Mean	2502	2527	2285	2438

S.E. of marginal means = 61.8 lb./ac.
 S.E. of body of table = 107.1 lb./ac.

Crop :- Barley.

Ref :- Pb. 53(9).

Site :- Barley Res. Farm, Gurgaon.

Type :- 'M'.

Object :—To assess the value of N and P₂O₅ fertilizers in relation to grain yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Mung*. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 12.11.1953. (iv) (a) 1 *Hindustan hal* ploughings. 4 *desi hal* ploughings. (b) to (e) N.A. (v) Nil. (vi) Barley type 4 (improved and early) (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) 6.55". (x) 3.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀=0, N₁=50 and N₂=100 lb./ac.(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=50 and P₂=100 lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/99 ac. (b) 40½'×9'. (v) 2 rows, one on each side of the plot kept as border. (vi) Yes.

4. GENERAL :

(i) Stand of crop good. No lodging. (ii) No incidence of diseases or pests was observed. (iii) Height, ear length, no. of grains per ear, and grain weight. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Heavy rain fall was received on 5th, 20th and 21st February 1954. (vii) Nil.

5. RESULTS :

(i) 1442 lb./ac.

(ii) 134.7 lb./ac.

(iii) Only N effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1080	1072	1018	1057
N ₁	1647	1566	1639	1617
N ₂	1527	1744	1682	1651
Mean	1418	1461	1446	1442

S.E. of marginal means = 38.9 lb./ac.
 S.E. of body of table = 67.4 lb./ac.

Crop :- Barley.
Site :- Barley Res. Farm, Gurgaon.

Ref :- Pb. 53(8).
Type :- 'M'

Object :- To compare the effect of A/S and C/N on the yield of Barley.

1. BASAL CONDITIONS :

(i) (a) Barley—Mung. (b) Mung. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 12.11.1953. (iv) (a) Preparatory tillage : 1 *Hindustan hal* ploughings and 4 *desi hal* ploughings. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) Barley type 4 (early). (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) 6.55'. (x) 3.4.1954.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 2 levels of N : $N_1=15$ and $N_2=30$ lb./ac.

(2) 2 sources of N : $S_1=A/S$ and $S_2=C/N$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (vi) (a) 1/99 ac. (b) $40\frac{1}{2}' \times 9'$. (v) 2 rows : 1 on each side of the plot kept as border. (vi) Yes.

4. GENERAL :

(i) Stand of crop good. No lodging. (ii) Nil. (iii) Height, ear length, number of grains per ear and grain weight. (iv) (a) 1953-54. (b) and (c) Nil. (v) (a) and (b) No. (vi) Heavy of rainfall was received on 5th, 20th and 21 February, 1954. (vii) Nil.

5. RESULTS :

(i) 1567 lb./ac.

(ii) 204.1 lb./ac.

(iii) N and "control vs. others" effects are significant while other effects are not significant.

(iv) Av. yield of grain in lb./ac.

Control=1338 lb./ac.

	S_1	S_2	Mean
N_1	1489	1493	1491
N_2	1786	1728	1757
Mean	1638	[1661	1624

S.E. of marginal means = 72.1 lb./ac.
S.E. of body of table = 102.0 lb./ac.

Crop :- Barley.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 48(66).
Type :- 'M'.

Object :- To find suitable dose of F.Y.M. to Barley crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 4.11.1948. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) and (e) N.A. (v) Nil. (vi) T-4 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26'. (x) 22 and 23.3.49. -

2. TREATMENTS :

1. F.Y.M. $2\frac{1}{2}$ ton/ac.

2. F.Y.M. 5 ton/ac.

3. F.Y.M. $7\frac{1}{2}$ ton/ac.

4. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) Nil. (b) N.A. (iii) 6. (iv) (a) 66'×24'. (b) 54.5'×20'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943—48. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 544.6 lb./ac.
 (ii) 123.0 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	472.7
2.	524.1
3.	657.6
4.	524.1
S.E./mean	=50.2 lb./ac.

Crop :- Barley.

Site :- Agri. Farm, Rohtak.

Ref :- Pb. 48(61).

Type :- 'C'.

Object :—To study the optimum date of sowing for Barley.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) T.4 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26". (x) 21.3.1949.

2. TREATMENTS :

5 sowing dates : D₁=2.10.1948, D₂=10.10.1948, D₃=18.10.1948, D₄=26.10.1948. and D₅=3.11.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 66'×20'. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943 to 1948. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 389.8 lb./ac.
 (ii) 77.80 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D ₁	349.7
D ₂	349.7
D ₃	452.6
D ₄	411.2
D ₅	385.7
S.E./mean	=31.76 lb./ac.

Crop :- Bajra (*Kharif*).

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 49(13).

Type :- 'M'.

Object :—To study the effect of different doses of A/S on yield of Bajra.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 27.7.1949. (iv) (a) 2 *desi hal* and 1 *sohaga*. (b) N.A. (c) 6 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) 12.56". (x) 3.11.1949.

2. TREATMENTS :

1. Control (no manure)
 2. 50 lb./ac. of N as A/S
 3. 100 lb./ac. of N as A/S
- A/S broadcast on 18.8.49 and 23.8.49

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) and (b) 22.25' x 95'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Fair to good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Crop was first sown on 16.7.1949, but germination was too poor, so it was resown on 27.7.1949.

5. RESULTS :

- (i) 585.9 lb./ac.
 (ii) 111.47 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	560.0
2.	546.8
3.	651.0
S./E. mean	=64.36 lb./ac.

Crop :- Bajra.

Site :- Soil Sub-Stn., Agri. Farm, Rohtak.

Ref :- Pb. 53(165).

Type :- 'M'.

Object :- To find the best manurial formula for yield of Bajra.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 19.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) T-55 (medium). (vii) Unirrigated. (viii) Nil. (ix) 15.27%. (x) 25.11.1953.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S (direct.)
3. 25 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Super (direct).
4. 25 lb./ac. of N as A/S by spraying.
5. 25 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Ammo. Phos. (direct).
6. 25 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Ammo. Phos. spray.

Fertilizers added on 23.8.1953 and sprayed on 24.8.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Forage yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 7.22 ton/ac.
 (ii) 1.46 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of forage in ton/ac.

Treatment	Av. yield.
1.	7.35
2.	7.01
3.	8.72
4.	6.22
5.	7.25
6.	6.77
S.E./mean	1.03 ton/ac.

Crop :- Bajra.
Site :- Agri. farm, Rohtak.

Ref :- Pb. 49(90).
Type :- 'M'.

Object :- To study the effect of application of A/S on the yield of Bajra.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 8.8.1949. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 2½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) T-55 (medium). (vii) Unirrigated. (viii) Nil. (ix) 7.86". (x) 24.10.1949.

2. TREATMENTS :

1. Control (no manure).
2. 16 lb./ac. of N as A/S.
3. 32 lb./ac. of N as A/S.
4. 48 lb./ac. of N as A/S.
A/S applied on 29.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1950. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1234 lb./ac.
(ii) 338.8 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	939
2.	1214
3.	1382
4.	1399
S.E./mean	=138.3 lb./ac.

Crop :- Bajra.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 50 (97).
Type :- 'M'.

Object :- To study the effect of application of A/S on the yield of Bajra.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 25.7.1950. (iv) (a) and (b) N.A. (c) 2½ sr. for the entire experimental area. (d) and (e) N.A. (v) Nil. (vi) T-55 (medium). (vii) Unirrigated. (viii) Nil. (ix) 13.99". (x) 12.10.1950.

2. TREATMENTS :

1. Control (no manure).
2. 16 lb./ac. of N as A/S.
3. 32 lb./ac. of N as A/S.
4. 48 lb./ac. of N as A/S.
A/S applied on 10.8.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 65'×24'. (b) 54.5'×20'. (v) N.A. (vi) Yes

4. GENERAL :

- (i) Fair to good. No lodging. (ii) Nil. (iii) Grain and forage yield. (iv) (a) 194) to 1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS

- (i) 474.2 lb./ac.
 (ii) 59.48 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	313.4
2.	435.0
3.	514.6
4.	633.7
S.E./mean	= 24.28 lb./ac.

Crop :- Bajra.

Site :- Agri. Stn., Ferozepur.

Ref :- Pb. 53 (20).

Type :- 'CM'.

Object :- To test the maximum potentiality of selection of T-55 variety of Bajra under unirrigated conditions.

1. BASAL CONDITIONS :

- (i) (a) Gram-Bajra-Fallow-Gram. (b) Gram. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18.7.1953.
 (iv) (a) 1 *raja* plough, 4 *desi* plough and 4 plankings. (b) *Kera* behind the plough. (d) N.A. (e)—. (v) Nil.
 (vi) T-55 (early). (vii) Unirrigated. (viii) 1 hoeing including weeding. (ix) 18.91%. (x) 14.10.1953.

2. TREATMENTS :

Moin-plot treatments :

2 row to row spacings : $S_1=1'$ and $S_2=1.5'$.

Sub-plot treatments :

4 levels of N : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac.

Sub-sub-plot treatments :

3 seed rates : $R_1=2$, $R_2=2.5$ and $R_3=3$ sr./ac.

N as A/S broadcast at the time of sowing.

3. DESIGN:

- (i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A.
 (iii) 4. (iv) (a) N.A. (b) $27' \times 9'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair to satisfactory. No lodging. (ii) Minor attack of cotton weevil. Spraying. (iii) Height, date of earing, germination count, and grain yield. (iv) (a) 1953 contd. (b) No. (c) Nil. (v) (a) No.(b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 615.9 lb./ac.
 (ii) (a) 260.2 lb./ac.
 (b) 391.3 lb./ac.
 (c) 217.0 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	Mean	R ₁	R ₂	R ₃
N ₀	587.6	505.1	547.4	481.1	566.1	595.2
N ₁	560.8	509.0	534.9	551.7	491.2	561.8
N ₂	664.5	630.9	647.7	580.5	744.7	618.0
N ₃	787.5	679.9	733.7	751.9	757.7	691.4
Mean	650.6	581.2	615.9	591.3	639.9	616.6
R ₁	599.2	583.4	591.3			
R ₂	663.3	616.5	639.9			
R ₃	689.3	543.8	616.6			

S.E. of difference of two

1. S marginal means = 53.11 lb./ac.
2. N marginal means = 113.00 lb./ac.
3. R marginal means = 54.25 lb./ac.
4. N means at the same level of S = 159.75 lb./ac.
5. S means at the same level of N = 148.19 lb./ac.
6. R means at the same level of S = 76.72 lb./ac.
7. S means at the same level of R = 82.14 lb./ac.
8. R means at the same levels of N = 108.50 lb./ac.
9. N means at the same level of R = 143.56 lb./ac.

Crop :- Bajra.

Ref :- Pb. 53(19).

Site :- Agri. Stn., Ferozpur.

Type :- 'IM'.

Object :- To find out maximum potentiality of A-1/3 variety of Bajra.

1. BASAL CONDITIONS :

(i) (a) Gram-Bajra-Wheat-Fallow. (b) N.A. (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 17.7.1953.
 (iv) (a) 1 *raja* plough 4 *desi* plough and 4 plankings (b) sowing with *kera*. (c) 2½ sr./ac. (d) N.A. (e) —. (v)
 Nil. (vi) A-1/3. (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 18.91% (x) 15.10.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : I₁=1, I₂=2 and I₃= 3 irrigations.

Sub-plot treatments :

4 levels of N as A/S : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 18'×10'.
 (v) No. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Germination count, growth, height, and grain yield and data of
 earing. (iv) (a) 1953—still continuing. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1668 lb./ac.
- (ii) (a) 220.1 lb./ac.
(b) 221.2 lb./ac.
- (iii) Only N effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
I ₁	1439	1600	1779	1963	1695
I ₂	1346	1395	1742	1965	1612
I ₃	1418	1608	1748	2009	1696
Mean	1401	1534	1756	1979	1668

S.E. of difference of two

1. I marginal means = 63.5 lb./ac.
2. N marginal means = 73.7 lb./ac.
3. N means at the same level of I = 127.7 lb./ac.
3. I means at the same level of N = 127.6 lb./ac.

Crop :- Jowar.

Ref :- Pb. 48 (39).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :--To study the effect of different sources of N on Jowar crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 18.7.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) Js-20 (medium). (vii) Irrigated. (viii) One weeding. (ix) 19.77". (x) 29.11.1948.

2. TREATMENTS :

1. Control (no manure).
2. 50 lb./ac. of N as F.Y.M.
3. 50 lb./ac. of N as A/S.
4. 50 lb./ac. of N as Ammo. Phos.
5. 25 lb./ac. of N as A/S.
6. 25 lb./ac. of N as Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 11'×88'. (b) 11'×88". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1947-1948. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 665.4 lb./ac.
- (ii) 119.14 lb./ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	578.6
2.	646.1
3.	665.4
4.	713.6
5.	578.6
6.	810.0
S.E./mean	= 48.6 lb./ac.

Crop :- Jowar.

Ref :- Pb. 50(77).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find the best source of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 16.7.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) Js-20 (medium). (vii) Irrigated. (viii) N.A. (ix) 28.31". (x) 26,27.11.1950.

2. TREATMENTS :

All combinations of (1) and (2) +a control.

(1) 3 sources of N : $S_1=A/S$, $S_2=Ammono. Phos.$ and $S_3=F.Y.M.$ (2) 2 levels of N : $N_1=50$ and $N_2=75$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/48 ac. (b) 1/48 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Green forage yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 20704 lb./ac.
(ii) 1256 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in lb./ac.

	Control =20761 lb./ac.			
	S_1	S_2	S_3	Mean
N_1	20242	20390	20390	20341
N_2	21600	20613	20933	21049
Mean	20921	20501	20661	20695

S.E. of marginal mean of S =444.1 lb./ac.

S.E. of marginal mean of N =362.6 lb./ac.

S.E. of body of table =628.0 lb./ac.

Crop :- Jowar.

Ref :- Pb. 51(118).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find the best source of N for Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 19.7.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) N.A. (ix) 13.15". (x) 31.9.1951.

2. TREATMENTS :

All combinations of (1) and (2) +a control.

(1) 3 sources of N : $S_1=A/S$, $S_2=Ammono. Phos.$ and $S_3=F.Y.M.$ (2) 2 levels of N : $N_1=50$ and $N_2=75$ lb./ac.

3. DESIGN

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5440 lb./ac.
 (ii) 1441.8 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of fodder in lb./ac.

Control = 5925 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	4649	5657	5472	5259
N ₂	4598	5215	6562	5458
Mean	4623	5436	6017	5359

S.E. of marginal mean of S = 509.8 lb./ac.
 S.E. of marginal mean of N = 416.2 lb./ac.
 S.E. of body of table = 720.9 lb./ac.

Crop :- Jowar.

Ref :- Pb. 52(155).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :- To find the best source of N for Jowar crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Very hard clay. (b) N.A. (iii) 18.7.1952. (iv) (a) to (e) N.A.
 (v) Nil. (vi) Js.-20 (medium). (vii) Irrigated. (viii) N.A. (ix) 19.78". (x) 5.6.10.1952.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

- (1) 3 sources of N : S₁=A/S, S₂=Ammo. Phos. and S₃=F.Y.M.
 (2) 2 levels of N : N₁=50 and N₂=75 lb./ac.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 76.5' x 15'. (v) Nil. (vi) Ycs.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950-52. (b) and (c) No. (v) (a) and (b) No.
 (vi) and (vii) Nil.

5. RESULTS :

- (i) 6075 lb./ac.
 (ii) 1352.2 lb./ac.
 (iii) Only S effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

Control = 5222 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	4617	7789	4812	5739
N ₂	6013	9019	5056	6696
Mean	5315	8404	4934	6218

S.E. of marginal mean of S = 478.1 lb./ac.
 S.E. of marginal mean of N = 390.1 lb./ac.
 S.E. of body of table = 676.1 lb./ac.

Crop :- Jowar (*Kharif*).
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 53(164).

Type :- 'M'.

Object :- To find out a suitable dose of manure for Jowar fodder.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 22.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Jowar-263 (medium). (vii) Unirrigated. (viii) Nil. (ix) 15.27". (x) 28.10.53. to 23.11.1953.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 25 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Super.
4. 25 lb./ac. of N as A/S spray.
5. 25 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Ammo. Phos.
6. 25 lb./ac. of N as A/S + 12½ lb./ac. of P₂O₅ as Ammo. Phos. (spray).

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/12 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 7.61 ton/ac.
(ii) 1.03 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	7.91
2.	8.27
3.	7.55
4.	6.94
5.	8.35
6.	6.61
S.E./mean	=0.75 ton/ac.

Crop :- Jowar.

Ref :- Pb. 50(100).

Site :- Agri. Farm, Rohtak.

Type :- 'M'.

Object :- To study the effect of organic manure prepared by different methods.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 19.7.1950 (iv) (a) 1 *raja*, 2 *desi* and 4 *sohaga*. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Js. 20 (medium). (vii) Irrigated. (viii) Nil. (ix) 6.14". (x) 4.9.1950.

2. TREATMENTS :

1. Control (no manure).
2. Heaped manure 200 md./ac.
3. Manure prepared by *zimindara* method at 200 md./ac.
4. Manure prepared by improved method at 200 md./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 18' × 48½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Forage yield. (i) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 16219 lb./ac.
- (ii) 2298.2 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	14474
2.	15398
3.	17451
4.	17554
S.E./mean	= 939.7 lb./ac.

Crop :- Jowar.

Ref :- Pb. 50(101).

Site :- Agri. Farm, Rohtak.

Type :- 'M'.

Object :—To study the effect of Ammo. Phos. applied to previous crop Berseem on succeeding crop of Jowar for fodder.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 19.7.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) Js-20 (medium). (vii) Unirrigated. (viii) Nil. (ix) 6.14". (x) 2.9.1950.

2. TREATMENTS :

- 1. Control (no manure).
 - 2. 40 lb./ac. of N as Ammo. Phos.
- Manure applied to previous crop Berseem.

3. DESIGN :

- (i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/10 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Green fodder yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17939 lb./ac.
- (ii) 2937.8 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in lb./ac.

Treatment	Av. yield
1.	15963
2.	19914
S.E./mean	= 1313.8 lb./ac.

Crop :- Jowar (*Kharif*).

Ref :- Pb. 51 (98).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'MV'.

Object :—To study the suitability of D.C.M. fertilizers for Jowar fodder.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 5.7.1951. (iv) (a) 1 *raja*, 5 *desi* and 6 *sohaga*. (b) N.A. (c) 3 ch $\frac{1}{2}$ tola to 3 ch $3\frac{1}{2}$ tolas. (d) and (e) N.A. (v) 3 C.L. of F.Y.M. on 30.6.1951. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (iv) 9.52". (x) 17.9.1951 to 2.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Js.-20$ (medium) and $V_2=Js.-263$ (medium).

(2) 6 manures : $M_0=0$, $M_1=60$ lb./ac. of N as A/S, $M_2=60$ lb./ac. of N as growth mixture, $M_3=60$ lb./ac. of N as general fertilizers, $M_4=60$ lb./ac. of N as irrigated sugarcane and $M_5=60$ lb./ac. of N as F.Y.M.

Half dose of M_1 to M_4 applied on 5.7.1951 and other half on 22.7.1951. F.Y.M. applied on 5.7.1951.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $62.5' \times 6.75'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Growth good. No lodging. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 12.29 ton./ac.

(ii) 1.88 ton./ac.

(iii) None of the effects is significant.

(iv) Av. yield of fodder in ton/ac.

	M_0	M_1	M_2	M_3	M_4	M_5	Mean
V_1	11.65	12.94	12.53	11.39	12.72	12.48	12.29
V_2	12.77	12.85	12.39	12.99	12.26	10.51	12.29
Mean	12.21	12.90	12.46	12.19	12.49	11.50	12.29

S.E. of marginal means of M = 0.54 ton/ac.

S.E. of marginal means of V = 0.31 ton/ac.

S.E. of body of table = 0.77 ton/ac.

Crop :- Jowar.

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 52 (28).

Type :- 'MV'.

Object :- To find the suitability of D.C.M. fertilizers for Jowar fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sarson. (c) F.Y.M. at 200 md./ac. (ii) (a) Light loamy. (b) Refer soil analysis, Sirsa. (iii) 10.6.1952. (iv) (a) 1 *raja* plough and 5 *desi* plough. (c) 24 to 30 sr./ac. (d) and (e) —. (v) No. (vi) As per treatments. (vii) Irrigated. (viii) One hoeing and weeding on 22.7.1952. (ix) $8.25'$. (x) V_1 : 26.8.1952 to 14.9.1952 ; V_2 : 15.9.1952 to 22.9.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Js-20$ (medium) and $V_2=Js-263$ (medium).

(2) 6 manures : $M_0=0$, $M_1=60$ lb./ac. of N as A/S, $M_2=60$ lb./ac. of N as growth mixture, $M_3=60$ lb./ac. of N as general fertilizer, $M_4=60$ lb./ac. of N as irrigated sugarcane and $M_5=60$ lb./ac. of N as F.Y.M.

F.Y.M. broadcast on 4.6.1952. Half dose of other fertilizers broadcast on 10.6.1952 and the other half on 1.7.1952.

3. DESIGN :

(i) 2×6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) $6' \times 64'$. (v) Nil. (vi) Yes.

4. GENERAL :

Satisfactory. $Js-20$ lodged. (ii) No. (iii) Fodder yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Variety $Js-20$ harvested early due to lodging.

5. RESULTS :

- (i) 19.62 ton/ac.
(ii) 1.95 ton/ac.
(iii) V and M effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	Mean
V ₁	17.47	19.10	17.83	19.59	18.84	16.76	18.26
V ₂	18.20	20.45	21.57	23.48	20.99	21.17	20.98
Mean	17.84	19.73	20.98	21.54	19.92	18.97	19.62

S.E. of marginal mean of M = 0.56 ton/ac.
S.E. of marginal mean of V = 0.32 ton/ac.
S.E. of body of table = 0.80 ton/ac.

Crop :-Jowar.

Ref :-Pb. 53(51).

Site :-Fodder Res. Stn., Sirsa.

Type :-'MV'.

Object :—To find out the suitability of D.C.M. fertilizers for Jowar fodder.

1. BASAL CONDITIONS :

- (i) (a) No. (b) Gram. (c) Nil. (ii) (a) Loamy soil. (b) Refer soil analysis, Sirsa. (iii) 20.6.1953. (iv) (a) 5 *desi* plough, 1 *punchdanta* (horse hoe) and 2 *sohaga*. (b) N.A. (c) 24 to 30 sr./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 16.07". (x) 14.9.1953 to 25.9.1953.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 varieties : V
- ₁
- =Js-20 (medium) and V
- ₂
- =Js-263. (medium).

- (2) 6 manures : M
- ₀
- =0, M
- ₁
- =60 lb./ac. of N as A/S, M
- ₂
- =60 lb./ac. of N as growth mixture, M
- ₃
- =60 lb./ac. of N as general fertilizer, M
- ₄
- =60 lb./ac. of N as irrigated sugarcane and M
- ₅
- =60 lb./ac. of N as F.Y.M.

F.Y.M. broadcast at sowing time while half of other fertilizers applied on 20.6.1953 at sowing and other half on 30.7.1953.

3. DESIGN :

- (i) 2×6 Fact. in R.B.D. (ii) [(a) 12. (b) N.A. (iii) 6. (iv) (a) 9'×64'. (b) 7'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Nil. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14.48 ton/ac.
(ii) 2.99 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	Mean
V ₁	11.16	13.60	14.72	16.52	14.30	12.63	13.82
V ₂	14.52	13.14	15.43	16.13	16.34	15.19	15.13
Mean	12.84	13.37	15.08	16.33	15.32	13.91	14.48

S.E. of marginal mean of V = 0.50 ton/ac.
S.E. of marginal mean of M = 0.86 ton/ac.
S.E. of body of table = 1.22 ton/ac.

Crop :-Jowar.

Ref :-Pb. 48(38).

Site :-Distt. and Demonstration. Farm, Ambala.

Type :-'C'.

Object :—To find out the effect of different intensities of cultivation with local and improved implements.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Clay. (b) N.A. (iii) N.A. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) Js-20. (vii) Irrigated. (viii) Nil. (ix) 19.77". (x) N.A.

2. TREATMENTS :

1. Improved high : 1 *raja* and 2 *desi* plough and 2 horse hoe.
2. Improved low : 1 *raja* and 1 *desi* plough.
3. Improved medium : 1 *raja*, 1 *desi* plough and 1 horse hoe.
4. Local high : 5 *desi* plough.
5. Local low : 2 *desi* plough.
6. Local medium : 3 *desi* plough.

3. DESIGN ;

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 28'×158'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Fodder {yield. (iv) (a) 1947--1948. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 8481 lb./ac.
- (ii) 3268.2 lb./ac.
- (iii) The treatments are not significantly different.
- (iv) Av. yield of fodder in lb./ac.

Treatment	Av. yield
1.	8176
2.	9807
3.	7872
4.	7926
5.	8770
6.	8335
S.E./mean	=1334.3 lb./ac.

Crop :- Jowar.

Ref :- Pb. 48(44).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CV'.

Object :—To study the effect of seed rate on forage yield of Jowar.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 31.7.1948. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 15.43". (x) 29.9.1948 to 24.10.1948.

2. TREATMENTS :

All combinations of (1) and (2)

(1) varieties : $V_1=Js. 20$, $V_2=Js-100$ and $V_3=Js-263$.(2) seed rates : $S_1=20$, $S_2=30$, $S_3=40$ and $S_4=50$ sr./ac.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Design adopted in 1949 is split-plot, and has been conducted twice, see experiments No. 1949 (32, 36).

5. RESULTS :

- (i) 14.37 ton/ac.
(ii) 1.21 ton/ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of fodder in ton/ac.

	S ₁	S ₂	S ₃	S ₄	Mean
V ₁	13.53	12.60	13.90	14.51	13.63
V ₂	15.10	14.35	14.74	15.64	14.96
V ₃	14.62	14.70	14.15	14.63	14.52
Mean	14.42	13.88	14.26	14.93	14.37

S.E. of marginal mean of S = 0.35 ton/ac.
S.E. of marginal mean of V = 0.30 ton/ac.
S.E. of body of table = 0.61 ton/ac.

Crop :- Jowar (*Kharif*).

Ref :- Pb. 49(32).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'C V'.

Object :- To study the effect of different seed rates on yield of different varieties of Jowar when sown early.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rape. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 12.3.1949. (iv) (a) to (e) N.A. (v) 15 C.L./ac. of F.Y.M. applied from 14.2.1949. to 16.2.1949. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 3.23%. (x) 18.5.49 to 25.6.1949 and 30.7.49 to 22.8.1949

2. TREATMENTS :

Main-plot treatments :

3 varieties : V₁=Js-20, V₂=Js-100 and V₃=Js-263.

Sub-plot treatments :

4 seed rates : S₁=20, S₂=30, S₃=40 and S₄=50 sr./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 11.34'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. | No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 22.34 ton/ac.
(ii) (a) 4.01 ton/ac.
(b) 1.65 ton/ac.
(iii) Only interaction V×S is significant.
(iv) Av. yield of grain in ton/ac.

	S ₁	S ₂	S ₃	S ₄	Mean
V ₁	20.73	21.10	20.59	20.02	30.61
V ₂	20.33	23.78	22.52	20.71	21.83
V ₃	24.23	23.25	24.03	26.76	24.57
Mean	21.76	22.71	22.38	22.50	22.34

S.E. of difference of two
1. V marginal means = 1.41 ton/ac.
2. S marginal means = 0.68 ton/ac.
3. S means at the same level of V = 1.17 ton/ac.
4. V means at the same level of S = 1.74 ton/ac.

Crop :- Jowar (*Kharif*).
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 49(36).
Type :- 'CV'.

Object :- To study the effect of different seed rates on yield of different varieties of Jowar when sown late.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rape. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 6.8.1949. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 30 C.L. of F.Y.M. applied from 13.2.1949 to 28.2.1949. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 4.06". (x) 10.10. 1949 to 27.20.1949.

2. TREATMENTS :

Main-plot treatments :-

3 varieties : $V_1=Js.-20$, $V_2=Js-100$ and $V_3=Js-263$

Sub-plot treatments :

4 seed rates : $S_1=20$, $S_2=30$, $S_3=40$ and $S_4=50$ sr./ac.

3. DESIGN

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6'-9" x 64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good but growth restricted by continuous dry weather. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948-49. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 12.66 ton/ac.
(ii) (a) 1.52 ton/ac.
(b) 1.26 ton/ac.
(iii) None of the effects significant.
(iv) Av. yield of fodder in ton/ac.

	S_1	S_2	S_3	S_4	Mean
V_1	12.45	12.41	11.71	12.13	12.18
V_2	13.06	13.20	12.50	13.45	13.05
V_3	12.78	12.32	12.39	13.52	12.75
Mean	12.76	12.64	12.20	13.03	12.66

S.E. of difference of two

- | | |
|-----------------------------------|---------------|
| 1. V marginal means | =0.54 ton/ac. |
| 2. S marginal means | =0.51 ton/ac. |
| 3. S means at the same level of V | =0.89 ton/ac. |
| 4. V means at the same level of S | =0.94 ton/ac. |

Crop :- Jowar (*Kharif*).
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 50(29).
Type :- 'IMV'.

Object :- To study the effect of varying applications of manure and irrigation on two varieties of Jowar when sown early.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 9.4.1950. (iv) (a) 1 *raja*, 5 *desi* ploughings and 7 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 7.12". (x) 6 to 15.7.1950.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : $I_1=3$ (low), $I_2=5$ (medium) and $I_3=7$ (high) irrigations.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Js.-29$ (medium) and $V_2=Js.-263$ (medium).

(2) 3 doses of N : $N_0=0$, $N_1=50$ lb./ac. of N as A/S and $N_2=100$ lb./ac. of N as F.Y.M. F.Y.M. applied on 29.3.50 and A/S applied on 6.5.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/90 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950-to 1951. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 10.19 ton/ac.
 (ii) (a) 1.89 ton/ac.
 (b) 1.65 ton/ac.
 (iii) V effect is significant, M effect is highly significant. Other effects are not significant.
 (iv) Av. yield of fodder in ton/ac.

	N_0	N_1	N_2	Mean	V_1	V_2
I_1	6.37	11.20	9.40	8.99	8.49	9.49
I_2	7.03	14.19	9.90	10.37	9.59	11.16
I_3	8.04	14.80	10.81	11.22	10.45	11.98
Mean	7.15	13.40	10.04	10.19		
V_1	6.79	12.31	9.44	9.51		
V_2	7.51	14.49	10.64	10.88		

S.E. of marginal mean of N	=0.479 ton/ac.
S.E. of marginal mean of V	=0.391 ton/ac.
S.E. of body of table $N \times V$	=0.675 ton/ac.
S.E. of difference of two	
1. I marginal means	=0.788 ton/ac.
2. V means at the same level of I	=0.958 ton/ac.
3. I means at the same level of V	=1.028 ton/ac.
4. N means at the same level of I	=1.173 ton/ac.
5. I means at the same level of N	=1.231 ton/ac.

Crop :- Jowar (*Kharif*).
 Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 51(95).
 Type :- 'IMV'.

Object :- To study the effect of varying applications of manure and irrigation on two varieties of Jowar when sown early.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 1.4.1951. (iv) (a) to (c) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 5.48". (x) 21,22.6.1951.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : $I_1=2$ (low), $I_2=4$ (medium) and $I_3=6$ (high) irrigations.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Js-20$ (medium) and $V_2=Js-263$ (medium).

(2) 3 doses of N : $N_0=0$, $N_1=50$ lb./ac. of N as A/S. and $N_2=100$ lb./ac. of N as F.Y.M. F.Y.M. broadcast on 3.3.1951 and A/S on 31.3.1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/90 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination below normal specially [in low irrigation plots. No lodging. (ii) Nil. (iii) Fodder yield (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5.50 ton/ac.
 (ii) (a) 0.192 ton/ac.
 (b) 0.491 ton/ac.
 (iii) I, M and V effects are highly significant and interaction $I \times M$ is significant.
 (iv) Av. yield of fodder in ton/ac.

	N_0	N_1	N_2	Mean	V_1	V_2
I_1	2.67	5.36	4.48	4.17	3.71	4.63
I_2	3.75	7.24	6.20	5.73	5.30	6.15
I_3	4.62	8.98	6.66	6.75	6.18	7.33
Mean	3.68	7.19	5.78	5.55		
V_1	3.22	6.67	5.30	5.06		
V_2	4.13	7.72	6.26	6.04		

S.E. of marginal mean of N = 0.142 ton/ac.

S.E. of marginal mean of V = 0.116 ton/ac.

S.E. of body of table $N \times V$ = 0.200 ton/ac.

S.E. of difference of two

1. I marginal means = 0.078 ton/ac.

2. V means at the same level of I = 0.283 ton/ac.

3. I means at the same level of V = 0.215 ton/ac.

4. N means at the same level of I = 0.347 ton/ac.

5. I means at the same level of N = 0.294 ton/ac.

Crop :- Jowar (*Kharif*).

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 50(23).

Type :- 'IMV'.

Object :- To study the effect of varying applications of manure and irrigations on two varieties of jowar when sown at normal time.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Rape. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 23.6.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 8.47". (x) 25 to 28.8.1950.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : $I_1=3$ (low), $I_2=5$ (medium) and $I_3=7$ (high) irrigations.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=Js-20$ (medium) and $V_2=Js-263$ (medium).

(2) 3 doses of N : $N_0=0$, $N_1=50$ lb./ac. of N as A/S and $N_2=100$ lb./ac. of N as F.Y.M.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (iii) 2. (iv) (a) and (b) 12'×62'
(v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) Nil.
(b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 12.16 ton/ac.
(ii) (a) 0.30 ton/ac.
(b) 0.50 ton/ac.
(i) Only I, V and M effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

	N ₀	N ₁	N ₂	Mean	V ₁	V ₂
I ₁	9.42	12.73	11.18	11.11	9.88	12.34
I ₂	10.39	13.72	13.04	12.38	11.50	13.26
I ₃	11.25	14.20	13.54	13.00	12.20	13.80
Mean	10.35	13.85	12.59	12.16	11.19	13.13
V ₁	9.31	12.51	11.70	11.19		
V ₂	11.39	14.53	13.48	13.13		

S.E. of marginal mean of M =0.144 ton/ac.
S.E. of marginal mean of V =0.117 ton/ac.
S.E. of body of table N×V =0.205 ton/ac.
S.E. of difference of two
1. I marginal means =0.124 ton/ac.
2. V means at the same level of I =0.287 ton/ac.
3. I means at the same level of V =0.238 ton/ac.
4. N means at the same level of I =0.353 ton/ac.
5. I means at the same level of N =0.314 ton/ac.

Crop :- Jowar (Kharif).

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 51(97).

Type :- 'IMV'.

Object :- To study the effect of varying applications of manures and irrigations on two varieties when sown at normal time.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 3.7.1951. (iv) (a) 1 raja, 5 desi and 6 sohaga. (b) N.A. (c) 5½ ch./plot. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 5.48%. (x) 6, 13.9.1951.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : I₀=0 (no), I₁=2 (medium) and I₂=3 (high) irrigations.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 varieties : V₁=Js-20 (medium) and V₂=Js-263 (medium).

(2) 3 doses of N : N₀=0, N₁=50 lb./ac. of N as A/S and N₂=100 lb./ac. of N as F.Y.M.
F.Y.M. applied on 26.6.1951 and A/S applied on 28.7.1951.

3. DESIGN :

(i) Split plot. (ii) (a) 3 main-plots/block ; 6 sub-plot/main-plots. (iv) (a) N.A. (b) 62'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 9.78 ton/ac.
 (ii) (a) 0.237 ton/ac.
 (b) 0.704 ton/ac.
 (iii) I effect is significant and V and N effects are highly significant.
 (iv) Av. yield of fodder in ton/ac.

	N ₀	N ₁	N ₂	Mean	V ₁	V ₂
I ₀	7.88	10.35	9.55	9.26	8.89	9.64
I ₁	8.30	11.56	9.60	9.82	9.38	10.26
I ₂	8.14	11.90	10.77	10.37	9.81	10.23
Mean	8.11	11.27	9.98	9.78		
V ₁	7.48	10.89	9.70	9.36		
V ₂	8.73	11.65	10.24	10.21		

S.E. of marginal mean of N

=0.203 ton/ac.

S.E. of marginal mean of V

=0.166 ton/ac.

S.E. of body of table N×V

=0.287 ton/ac.

S.E. of difference of two

1. I marginal means
2. V means at the same level of I
3. I means at the same level of V
4. N means at the same level of I
5. I means at the same level of N

=0.096 ton/ac.

=0.406 ton/ac.

=0.303 ton/ac.

=0.498 ton/ac.

=0.418 ton/ac.

Crop :- Maize.

Ref :- Pb. 50(79).

Site :- Distt. and Demonstration Farm. Ambala.

Type :- 'M'.

Object :- To find the best source of N for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 29.7.1950. (iv) (a) and (b) N.A. (c) 3 ch/plot. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) One hoeing on 22.8.1959. (ix) 28.31'. (x) 11.10.1959.

2. TREATMENTS :

All combinations of (1) and (2) + a control (no manure).

(1) 3 forms of N : S₁=F.Y.M., S₂=Ammono. Phos. and S₃=A/S.

(2) 2 levels of N : N₁=40 and N₂=60 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 13'×62.04'. (b) 13×62.04 (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1769 lb./ac.
 (ii) 451.8 lb./ac.
 (iii) "Control vs. others" effect and interaction $N \times S$ are significant.
 (iv) Av. yield of grain in lb./ac.

Control=2182 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	1722	2062	1754	1846
N ₂	1886	1176	1604	1555
Mean	1804	1619	1679	1701

S.E. of marginal mean of S = 120.8 lb./ac.
 S.E. of marginal mean of N = 106.5 lb./ac.
 S.E. of body of table = 184.5 lb./ac.

Crop :- Maize.

Ref :- Pb. 52(156).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :- To find a suitable dose of A/S for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Peas. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 18.7.1952. (iv) (a) to (e) N.A. (v) 12 C.L./ac. of city compost ; date N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 19.78°. (x) 9.10.1952.

2. TREATMENTS :

1. Control (no manure).
2. 40 lb./ac. of N as A/S.
3. 60 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×65'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-53. (b) and (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2192 lb./ac.
 (ii) 368.9 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1922
2.	2119
3.	2534
S E /mean	= 150.6 lb./ac.

Crop :- Maize.

Ref :- Pb. 53(226).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find a suitable dose of A/S for Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Hard clayey. (b) N.A. (iii) 1.7.1953. (iv) (a) and (b) N.A. (c) 9 sr. 6 ch./plot. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 25.61^g. (x) 21,22.9. 1953.

2. TREATMENTS :

1. Control (no manure).
2. 40 lb./ac. of N as A/S.
3. 60 lb./ac. of N as A/S.

Half dose applied on 1.7.1953 while the other half on 17.7.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 72.6'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1952-1953. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1004 lb./ac.
- (ii) 130.6 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	688
2.	1092
3.	1233
S.E./mean	=53.3 lb./ac.

Crop :- Maize.

Ref :- Pb. 53(227).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'M'.

Object :—To find out a suitable manurial formula for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 1.7.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 25.61^g. (x) 29.9.1953.

2. TREATMENTS :

1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.
4. 50 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super.
5. 100 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super.
6. 100 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super+25 lb./ac. of K₂O as Pot. Nitrate.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 72.6'×10'. (v) N.A. (vi) Yes.

4. GENERAL .

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1348 lb./ac.
 (ii) 175.1 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	982
2.	1185
3.	1476
4.	1126
5.	1823
6.	1497
S.E./mean	= 101.1 lb./ac.

Crop :- Maize (*Kharif*).
 Site :- Oilseed Sub-Stn., Gummar.

Ref :- Pb. 51 (140).
 Type :- 'M'.

Object :—To study the effect of A/S and Super on the yield of Maize.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 1.7.1951. (iv) (a) N.A. (b) Broadcast. (c) 5 sr. of seed for all plots. (d) and (e) —. (v) Nil. (vi) Local (medium). (vii) Rainfed. (viii) 3 hoeings and weedings. (ix) 40.89° approx. (x) 17.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

A/S applied on 9.8.1951.

3. DESIGN :

- (i) 3x2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80.5 ac. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination and condition normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1123 lb./ac.
 (ii) 119.6 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P_0	P_1	Mean
N_0	756	756	756
N_1	1270	1395	1333
N_2	1245	1317	1281
Mean	1090	1156	1123

S.E. of marginal mean of N = 42.3 lb./ac.
 S.E. of marginal mean of P = 34.5 lb./ac.
 S.E. of body of table = 59.8 lb./ac.

Crop :- Maize (*Kharif*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 49 (9).
Type :- 'M'.

Object :—To study the effect of A/S on fodder yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.7.1949. (iv) (a) 1 *Hindustan*, 2 *desi hal* and 2 *sohaga*. (b) to (e) N.A. (v) 13 C.L. of F.Y.M./ac. as basal dose on 19, 20.6.1949. (vi) Local. (vii) Irrigated. (viii) One bund making, one hoeing and one *panjdanti*. (ix) 18.11". (x) 17 to 27.9.1949.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as A/S.
3. 200 lb./ac. of N as A/S.

Half dose of A/S was applied on 13.8.1949. while the other half was applied on 18.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 16'×68'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) Not contd. (b) No. (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 18029 lb./ac.
- (ii) 1371.4 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of fodder in lb./ac.

Treatment	Av. yield
1.	14707
2.	19747
3.	19632
S.E./mean = 613.3 lb./ac.	

Crop :- Maize (*Kharif*).
Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 49(8).
Type :- 'M'.

Object :—To compare the effect of different doses of Ammo. Phos. and A/S on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 15.7.1949. (iv) (a) 1 *Hindustan*, 5 *desi* ploughings, 3 *sohaga*, and 1 horse hoe. (b) to (e) N.A. (v) 13 C.L./ac. of F.Y.M. on 19, 20.6.1949. (vi) Local. (vii) Irrigated. (viii) 2 hoeings cum weeding. (ix) 18.11". (x) 19.10.1949.

2. TREATMENTS :

1. Control.
2. 75 lb./ac. of N as A/S
3. 150 lb./ac. of N as A/S
4. 75 lb./ac. of N as Ammo. Phos.
5. 150 lb./ac. of N as Ammo. Phos.
6. 75 lb./ac. of N as A/S+95 lb./ac. of P₂O₅ as Super.
7. 150 lb./ac. of N as A/S+190 lb./ac. of P₂O₅ as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 16'×70'. (b) 14'×62' 2.7". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory ; growth fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1665 lb./ac.
 (ii) 263.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1435
2.	1810
3.	1782
4.	1666
5.	1702
6.	1623
7.	1638
S.E./mean	=117.9 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 50(9).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To compare the effect of different doses of Ammo. Phos. and A/S on the yield of Maize crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.6.1950. (iv) (a) 4 ploughings, and 5 *sohaga*. (b) and (c) N.A. (d) 1½' row to row. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings cum weeding. (ix) 53.24". (x) 15.10.1950.

2. TREATMENTS :

- Control.
- 75 lb./ac. of N as A/S.
- 150 lb./ac. of N as A/S.
- 75 lb./ac. of N as Ammo. Phos.
- 150 lb./ac. of N as Ammo. Phos.
- 75 lb./ac. of N as A/S+95 lb./ac. of P₂O₅ as Super.
- 150 lb./ac. of N as A/S+190 lb./ac. of P₂O₅ as Super.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×82½'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1338 lb./ac.
 (ii) 218.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	897
2.	1406
3.	1748
4.	1160
5.	1392
6.	1358
7.	1406
S.E./mean	=109.2 lb./ac.

Crop :-Maize (*Kharif*).
Site :-Govt. Agri. Stn., Gurdaspur.

Ref :-Pb. 51(68).
Type :-'M'.

Object :—To compare the effect of different doses of Ammo. Phos. and A/S on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 26.6.1951. (iv) (a) 7 *desi hal* and 6 *sohaga*, (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Once gap filling and 2 hoeings. (ix) 11.59°. (x) 21.9.1951.

2. TREATMENTS :

1. Control.
 2. 75 lb./ac. of N as A/S.
 3. 150 lb./ac. of N as A/S.
 4. 75 lb./ac. of N as Ammo. Phos.
 5. 150 lb./ac. of N as Ammo. Phos.
 6. 75 lb./ac. of N as A/S+ 95 lb./ac. of P_2O_5 as Super.
 7. 150 lb./ac. of N as A/S+190 lb./ac. of P_2O_5 as Super.
- A/S and Ammo. Phos. were applied on 2.8.1951 while Super was applied on 25.6.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×75'-7½". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. Growth fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1237 lb./ac.
(ii) 293.5 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
1.	895
2.	1137
3.	1361
4.	1151
5.	1253
6.	1568
7.	1296
S.E./mean	=146.7 lb./ac.

Crop :-Maize (*Kharif*).
Site :-Govt. Agri. Stn., Gurdaspur.

Ref :-Pb. 49(7).
Type :-'M'.

Object :—To study the effect of different doses of N as A/S and Ammo. Phos. on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3.7.1949. (iv) (a) 1 *Hindustan*, 5 *desi* ploughings, 3 *sohaga*, and 1 horse hoe. (b) to (e) N.A. (v) 13 C.L./ac. of F.Y.M. on 19.6.1949 to 20.6.1949. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 18.11°. (x) 19.10.1949.

2. TREATMENTS :

- All combinations of (1) and (2)+a control.
(1) 3 levels of N : $N_1=50$, $N_2=100$ and $N_3=150$ lb./ac.
(2) 2 sources of N : $S_1=A/S$ and $S_2=Ammo. Phos.$
A/S and Ammo. Phos. broadcast on 13.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 16'×70' (b) 14'×62'-2.7". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. Growth fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1365 lb./ac.
 (ii) 213.3 lb./ac.
 (iii) Only "control vs. others" effect is significant.
 (iv) Av. yield of grain in lb./ac.

Control = 998 lb./ac.				
	N ₁	N ₂	N ₃	Mean
S ₁	1363	1338	1509	1403
S ₂	1377	1476	1497	1450
Mean	1370	1407	1503	1427

S.E. of marginal mean of N = 67.4 lb./ac.
 S.E. of marginal mean of S = 55.1 lb./ac.
 S.E. of body of table = 95.4 lb./ac.

Crop :- Maize (*Kharij*).

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 50(8).

Type :- 'M'.

Object :- To study the effect of different doses of N as A/S and Ammo. Phos. on the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 20.6.1950. (iv) (a) 4 ploughings, and 5 *sohaga*. (b) and (c) N.A. (d) 1½' row to row. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings cum weeding. (ix) 54.24". (x) 15.10.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 levels of N : N₁=50, N₂=100 and N₃=150 lb./ac.

(2) 2 sources of N : S₁=A/S and S₂=Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 16'×60½'. (b) 12'×60½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1278 lb./ac.
 (ii) 237.8 lb./ac.
 (iii) Only "control vs. others" effect is highly significant.

(iv) Av. yield of grain in lb./ac.

Control=953 lb./ac.				
	N ₁	N ₂	N ₃	Mean
S ₁	1254	1589	1311	1385
S ₂	1250	1419	1173	1281
Mean	1252	1504	1242	1333

S.E. of marginal mean of N = 84.1 lb./ac.
 S.E. of marginal mean of S = 68.6 lb./ac.
 S.E. of body of table = 118.9 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 51(70).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object:—To study the effect of graded doses of N as F.Y.M, A/S and Ammo. Phos. on the yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 23.6.1951. (iv) (a) 4 *desi hal*, 4 *sohaga* and 1 roller. (b) N.A. (c) 9 to 11 sr./ac. (d) 1' row to row. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 1 gap filling. (ix) 11.59%. (x) 20.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 doses of N : N₁=50, N₂=75 and N₃=100 lb./ac.(2) 3 sources of N : S₁=F.Y.M, S₂=A/S and S₃=Ammo. Phos.

F.Y.M. applied on 22.6.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×60½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Growth normal but crop received setback during the month of Sept. due to long draught. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1701 lb./ac.
 (ii) 332.9 lb./ac.
 (iii) "Control vs. others effect" is highly significant and S effect is significant.
 (iv) Av. yield of grain in lb./ac.

Control=1337 lb./ac.				
	N ₁	N ₂	N ₃	Mean
S ₁	1619	1563	1592	1591
S ₂	1772	1666	1657	1698
S ₃	1972	2019	1813	1935
Mean	1788	1749	1687	1741

S.E. of any marginal mean = 78.5 lb./ac.
 S.E. of body of table = 135.9 lb./ac.

Crop :- Maize.

Ref :- Pb. 52(39).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of different doses of A/S on the yield of Maize.

1. BASAL CONDITIONS

(i) (a) Maize—Berseem. (b) Berseem. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.6.1952. (iv) (a) 4 ploughings and 6 *sohaga*. (b) N.A. (c) 22½ sr./ac. + 3 sr./ac. for filling up gaps. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 22.19°. (x) 16.9.1952.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac. of N as A/S.
 3. 75 lb./ac. of N as A/S.
 4. 100 lb./ac. of N as A/S.
- Fertilizers applied on 4.7.1952 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 18'×77'-7½". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory ; growth normal. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b)—. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2074 lb./ac.
 (ii) 289.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1909
2.	2117
3.	2060
4.	2210
S.E./mean	= 118.2 lb./ac.

Crop :- Maize.

Ref :- Pb. 52(40).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of different doses of A/S and Ammo. Phos. on the yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 7.7.1952. (iv) (a) 9 ploughings and 10 *sohaga*. (b) N.A. (c) 18 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 1 hoeing, 1 weeding, 2 thinnings and 1 horse hoe. (ix) 22.19°. (x) 24.9.1952.

2. TREATMENTS :

- All combinations of (1) and (2) + a control.
 (1) 2 levels of N : N₁=75 and N₂=100 lb./ac.
 (2) 2 sources of N : S₁=A/S and S₂=Ammo. Phos.
 Ammo. Phos. and A/S broadcast on 26.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×66'. (v) No. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2314 lb./ac.
- (ii) 477.5 lb./ac.
- (iii) None of the effects is significant.
- (iv) Av. yield of grain in lb./ac.

Control=2021 lb./ac.

	S ₁	S ₂	Mean
N ₁	2349	2146	2248
N ₂	2625	2428	2527
Mean	2487	2287	2387

S.E. of any marginal mean = 137.8 lb./ac.

S.E. of body of table = 194.9 lb./ac.

Crop :- Maize.

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 53(64).

Type :- 'M'.

Object :- To study the effect of A/S and Super on the yield of Maize crop.

1. BASAL CONDITIONS :

- (i) (a) Not followed. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22.6.1953. (iv) (a) 4 ploughings and 8 *sohaga*. (b) *Kera*. (c) 16 sr./ac. (d) 1' row to row. (e) —. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings, one horse hoe and one hoeing with *Khurpa*. (ix) 34.12". (x) 27.9.1953.

2. TREATMENTS :

- 1. Control.
 - 2. 60 lb./ac. of N as A/S.
 - 3. 60 lb./ac. of P₂O₅ as Super.
- A/S applied by *kera* on 31.7.1953 and Super drilled before sowing on 22.6.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 81' × 24'. (b) 72'-7½" × 20'. (v) Two rows left on breadth side each and nearly 4' left on both sides of the length of each plot including bunds. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield only. (iv) (a) 1953-1954 (conducted in 1954 with one more treatment). (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 93.65 lb./ac.
- (ii) 20.31 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	91.29
2.	89.36
3.	100.29
S.E./mean	= 8.29 lb./ac.

Crop :- Maize.

Ref :- Pb. 53(75).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of different methods of application of A/S to irrigated Maize crop.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Berseem. (c) 20 sr. of A/S on 28.11.1952. (ii) (a) Heavy loam. (b) N.A. (iii) 16.7.1953. (iv) (a) 4 ploughings, 6 *sohaga* and 1 horse hoe. (b) N.A. (c) 10-12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 34.12". (x) 20.10.1953.

2. TREATMENTS :

1. Control.
 2. 60 lb./ac. of N as A/S in contact.
 3. 60 lb./ac. of N as A/S drilled below seed at sowing.
 4. 60 lb./ac. of N as A/S broadcast just before sowing.
 5. 60 lb./ac. of N as A/S with 2nd irrigation.
 6. 60 lb./ac. of N as A/S lateral application of 6" on both sides with 2nd irrigation.
 7. 60 lb./ac. of N as A/S lateral application of 6" on both sides at sowing.
- A/S applied on 18.7.1953 but in treatments 5 and 6 applied on 15.8.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 12' x 75'-7½". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination of crop satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1807 lb./ac.
 (ii) 253.1 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1563
2.	2090
3.	1901
4.	1893
5.	1670
6.	1728
7.	1802
S.E./mean	= 103.3 lb./ac.

Crop :- Maize.

Ref :- Pb. 53 (125).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To study the effect of different doses of A/S and Super on yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.7.1953. (iv) (a) 5 *desi* ploughings, 6 *sohaga* and 1 roller. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Nil. (viii) One hoeing. (ix) 11.62". (x) 6.10.1953.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac. of N as A/S.
 3. 100 lb./ac. of N as A/S.
 4. 50 lb./ac. of N as A/S + 25 lb./ac. of P₂O₅ as Super.
 5. 100 lb./ac. of N as A/S + 50 lb./ac. of P₂O₅ as Super.
 6. 100 lb./ac. of N as A/S + 50 lb./ac. of P₂O₅ as Super + 25 lb./ac. of K₂O.
- Super applied on 22.6.1953 before sowing and A/S applied on 3.9.1953 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 18'×74'. (b) 18'×67'2.7". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Cob weight. (iv) (a) Not continued. (b) No. (c)—.
(v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 3174 lb./ac.
(ii) 361.6 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3018
2.	3110
3.	3374
4.	3110
5.	2981
6.	3448
S.E./mean	= 180.8 lb./ac.

Crop :- Maize.

Ref :- Pb. 48 (18).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of different fertilizers on forage yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 25.7.1948.
(iv) (a) 1 raja, 3 desi ploughs and 1 horse hoe. (b) N.A. (c) 18 sr. 12 ch./ac. (d) and (e) N.A. (v) Nil.
(vi) Local (medium). (vii) Irrigated. (viii) Nil. (ix) 17.36". (x) 11.9.1948 to 4.10.1948.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/N.
4. 100 lb./ac. of N as Ammo. Phos.
5. 125 lb./ac. of P₂O₅ as Super,

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 10. (iv) (a) 12'×52'. (b) 12'×45'-4½". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield only. (iv) (a) 1948 to 1951, (contd. with modification.)
(b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 11.16 ton/ac.
(ii) 0.67 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	10.79
2.	11.42
3.	11.21
4.	11.42
5.	10.97
S.E./mean	= 0.21 ton/ac.

Crop :- Maize (*Kharif*).
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 49(21).
Type :- 'M'.

Object :- To study the effect of different fertilizers on forage yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.7.1949. (iv) (a) 1 *raja* ploughing, 5 *desi* ploughings, 4 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) One hoeing cum weeding. (ix) 12.56". (x) 5.9.1949 to 14.9.1949.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/N.
4. 100 lb./ac. of N as Ammo. Phos.
5. 125 lb./ac. of P₂O₅ as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 10. (iv) (a) and (b) 12' x 52'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good but condition poor. No lodging. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1948 to 1951 (contd. with modification.) (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 6.33 ton/ac.
(ii) 0.62 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatments	Av. yield
1.	6.32
2.	6.39
3.	5.99
4.	6.66
5.	6.30
S.E./mean	=0.19 ton/ac.

Crop :- Maize (*Kharif*).
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 50(21).
Type :- 'M'.

Object :- To study the effect of different fertilizers on grain yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 16.7.1950. (iv) (a) one *raja*, 3 *desi hal* and one horse hoe. (b) and (c) N.A. (d) 1½' row to row. (e) N.A. (v) 5 ton/ac. of compost applied on 28 and 30.6.1950. (vi) Local (medium). (vii) Irrigated. (viii) 2 hoeings and weeding. (ix) 47.04". (x) 15.10.1950.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 100 lb./ac. of N as G.N.C.
6. 100 lb./ac. of P₂O₅ as Super.

Super and G.N.C. broadcast on 15.7.1950 and A/S and Ammo. Phos. broadcast on 7.8.1950 and 24.8.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 85.07'. (v) Nil. (vi) Nil.

4. GENERAL :

(i) Germination very poor. Excessive rain damaged the germination of the crop. Some gap filling was done where necessary. Severe lodging on 7.9.1950 and 19.9.1950 due to winds. (ii) Attack of borer specially in G.N.C. plots. (iii) Grain yield and stalk length. (iv) (a) 1948 to 1951 (contd. with modifications.) (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Excessive rains. (vii) Nil.

5. RESULTS :

- (i) 597.6 lb./ac.
 (ii) 117.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	349.7
2.	386.7
3.	1025.5
4.	949.4
5.	513.3
6.	361.0
S.E./mean	=58.62 lb./ac.

Crop :- Maize (*Rabi*).

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 51(80).

Type :- 'M'.

Object :- To study the effect of different fertilizers on grain yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Wheat—Maize—Wheat. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 11.7.1951. (iv) (a) 5 *desi hal*, 5 *sohaga* and 1 roller. (b) N.A. (c) 8 sr./ac. (d) 1½' row to row. (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) One gap filling and one thinning. (ix) 11.63". (x) 8,9,10.1951.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 100 lb./ac. of N as G.N.C.
6. 125 lb./ac. of P₂O₅ as Super.

F.Y.M. was applied on 1.7.1951 while Super, A/S, Ammo. Phos. and G.N.C. were applied on 7.8.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 8' x 85.07'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Attack of borer observed. (iii) Grain and straw yield. (iv) (a) 1948—51 (contd. with modifications.) (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1768 lb./ac.
 (ii) 249.7 lb./ac.
 (iii) Treatments are highly significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1296
2.	1648
3.	2156
4.	2351
5.	1851
6.	1304
S.E./mean	= 124.8 lb./ac.

Crop :-Maize.

Ref :-Pb. 48 (19).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'M'

Object :-To find the best manurial formula for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize—Wheat—*Guara* (G.M.)—Wheat. (b) Berseem. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20.7.1948. (iv) (a) 1 *raja* and 3 *desi* plough. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 17.36". (x) 5.10.1948.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 150 lb./ac. of N as F.Y.M.
4. 100 lb./ac. of N as A/S.
5. 150 lb./ac. of N as A/S.
6. 50 lb./ac. of N as F.Y.M. + 50 lb./ac. of N as A/S.
7. 75 lb./ac. of N as F.Y.M. + 75 lb./ac. of N as A/S.

A/S applied on 8.8.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 7' x 47'. (b) 7' x 43' 2.57'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield and green weight of stalks. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3004 lb./ac.
- (ii) 226.8 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2808
2.	2808
3.	2719
4.	3268
5.	3203
6.	3009
7.	3215
S.E./mean	= 92.6 lb./ac.

Crop :-Maize.

Ref :-Pb. 48(17).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'M'.

Object :-To find the best source of N for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Maize-Senji-Sugarcane-Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 17.7.1948 and 31.7.1948. (iv) (a) For first five replications : 1 *raja* plough, 2 horse hoe and 6 *desi* ploughs. For next five replications : 4 *desi* ploughs. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil (vi) Local. (vii) Irrigated. (viii) One hoeing for first five replications and 3 hoeings for next five replications. (ix) 17.36". (x) 4.10.1951 and 21.10.1948.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 2 doses of N : $N_1=100$ and $N_2=150$ lb./ac.(2) 2 sources of N : $S_1=A/S$ and $S_2=Ammono. Phos.$

A/S and Ammono. Phos. applied on 18.8.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 10. (iv) (a) $110' \times 12'$. (b) $90'-9" \times 12'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield and green stalk weight. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 2803 lb./ac.

(ii) 197.6 lb./ac.

(iii) Only "control vs others" effect is highly significant.

(iv) Av. yield of grain in lb./ac.

	Control	=2045 lb./ac.	
	N_1	N_2	Mean
S_1	2886	3035	2960
S_2	3018	3029	3024
Mean	2952	3032	2992

S.E. of any marginal mean =44.2 lb./ac.

S.E. of body of table =62.5 lb./ac.

Crop :-Maize (*Kharif*).

Ref :-Pb. 49(22).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'M'.

Object :-To find the best dose of A/S for Maize crop.

1. BASAL CONDITIONS :

(i) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 27.7.1949. (iv) (a) One *raja* ploughing, 4 *desi* ploughings, 5 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 12.56". (x) 9 to 12.10.1949.

2. TREATMENTS :

1. Control.

2. 50 lb./ac. of N as A/S.

3. 100 lb./ac. of N as A/S.

4. 150 lb./ac. of N as A/S.

Treatment No. 2 applied in full on 15.8.1949 while treatments 3 and 4 applied half on 15.8.1949 and half on 24.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 43'×103'. (b) 1/10 th of an ac. (v) Nil (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment during 1950 was not conducted.

5. RESULTS :

- (i) 2013 lb./ac.
 (ii) 77.1 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1918
2.	1997
3.	1986
4.	2149
S.E./mean	=31.5 lb./ac.

Crop :- Maize.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 51(89).

Type :- 'M'.

Object :- To find the best dose of A/S for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 15, 16.7.1951. (iv) (a) 5 *desi hal*, 4 *sohaga* and one roller. (b) N.A. (c) 10—12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) One gap filling and 2 hoeings. (ix) 11.63". (x) 11, 12.10.1951.

2. TREATMENTS :

- Control.
 - 50 lb./ac. of N as A/S.
 - 100 lb./ac. of N as A/S.
 - 150 lb./ac. of N as A/S.
- A/S applied on 5.8.1951 and 14.8.1951 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 110'×43'. (b) 101.3'×43'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory ; growth good. No lodging. (ii) Nil. (iii) Grain and cob yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1722 lb./ac.
 (ii) 282.9 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1196
2.	1649
3.	1830
4.	2212
S.E./mean	= 141.5 lb./ac.

Crop :- Maize.

Ref :- Pb. 52(63).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find the best dose of A/S for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 18.7.1952. (iv) (a) 6 *desi* plough, 4 *sohaga* and one horse hoe. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) One thinning, 2 weedings and 2 hoeings. (ix) 26 21". (x) 6.10.1252.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac of N as A/S.
 3. 100 lb./ac. of N as A/S.
 4. 150 lb./ac. of N as A/S.
- A/S applied on 25.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 99'×11'. (b) 99'×8'. (v) 1½' left along the breadth side. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield and stalk length. (iv) (a) 1949—1952. (b) No. (c) Nil (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2773 lb./ac.
- (ii) 389.4 lb /ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1513
2.	2984 -
3.	3394
4.	3200
S.E /mean	= 194.7 lb./ac.

Crop :- Maize.

Ref :- Pb. 53(89).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object—To study the effect of N, P and K on yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 14.8.1953. (iv) (a) *Raja hal*, 6 *desi hal*, 5 *sohaga* and 2 horse hoe. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings, 2 thinnings and 3 hoeings. (ix) 24.61". (x) 14.8.1953.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac. of N as A/S.
 3. 100 lb./ac. of N as A/S.
 4. 50 lb./ac. of N as A/S+25 lb./ac. of P₂O₅ as Super.
 5. 100 lb./ac. of N as A/S+50 lb./ac. of P₂O₅ as Super.
 6. 100 lb./ac. of N as A/S+50 lb./ac. of P₂O₅ as Super.+25 lb./ac. of K₂O as Pot. Sul.
- K₂O and P₂O₅ applied before sowing. Half A/S applied on 9.9.1953 and other half on 25.9.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 106'×10'. (b) 99'×8' (v) 1' along the breadth and 3'-6' along the length. (vi) Yes.

4. GENERAL :

- (i) Germination and condition good. No lodging. (ii) Spraying with Agrocide on 28.8.1953. No incidence of pest or disease available in records. (iii) Grain yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Expt. was originally planned with 6 replications but conducted with 5 replications only.

5. RESULTS :

- (i) 3042 lb./ac.
 (ii) 404.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1990
2.	3068
3.	3292
4.	3196
5.	3295
6.	3408
S.E./mean	= 180.9 lb./ac.

Crop :- Maize.

Ref :- Pb. 48(1).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :- To study the effect of A/S on yield of Maize.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20.5.1948. (iv) (a) and (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 28.79". (x) 16.10.1948.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac. of N as A/S.

3. DESIGN :

- (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) and (b) 15' x 37'-2.8". (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) Not continued. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1986 lb./ac.
 (ii) 436.8 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1762
2.	2210
S.E./mean	= 126.1 lb./ac.

Crop :- Maize.

Ref :- Pb. 53 (46).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :—To study the effect of A/S on yield of Maize when cobs have appeared and grain is setting in.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 16.6.1953. (iv) (a) 2 ploughings and 3 plankings. (b) Broadcast. (c) N.A. (d) and (e)—. (v) No. (vi) Local (medium). (vii) Irrigated. (viii) N.A. (ix) 69.98%. (x) 13.9.1953.

2. TREATMENTS :

1. Control.
2. 20 lb /ac. of N as A/S.
A/S applied on 29.8.1950 with irrigation.

3. DESIGN :

(i) (a) Paired plot. (ii) (a) 2. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 13½'×81'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) Not corrtd. (b) No. (c)—. (v) (a) No. (b)—. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 850.3 lb./ac.
(ii) 61.47 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	860.5
2.	840.1
S.E./mean	= 43.46 lb./ac.

Crop :- Maize.

Ref :- Pb. 53 (45).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'M'.

Object :—To find out whether fertilizer alone or in combination gives economic yield over the control.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24.6.1953. (iv) (a) 3 ploughings and 2 plankings. (b) N.A. (c) 20-25 sr./ac. (d) and (e) N.A. (v) 54 md./ac. of F.Y.M. applied. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 69.98%. (x) 16, 17.9.1953.

2. TREATMENTS :

1. Control (no manure).
2. 50 lb./ac. of P₂O₅ as B.M.
3. 100 lb./ac. of N as A/S+50 lb./ac. of P₂O₅ as B.M.
4. 100 lb./ac. of N as A/S.
5. 100 lb./ac. of N as A/S+50 lb./ac. of P₂O₅ as Super.
Fertilizers broadcast on 24.6.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×62.2'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Below normal. High winds coupled with rainfall resulted in lodging of crop. (ii) Nil. (iii) Grain yield only. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) Nil. (vii) Maize was sown comparatively late in the season. There were heavy and continuous rains in the season which affected the yield of crop.

5. RESULTS :

- (i) 745.5 lb./ac.
 (ii) 37.77 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	450.2
2.	522.2
3.	1242.5
4.	648.3
5.	864.4
S.E./mean	= 18.89 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 52(143).

Site :- Cereal Breeding Sub. Stn., Katrain.

Type :- 'M'.

Object :—To ascertain the optimum manurial requirement of Maize.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 13.6.1952. (iv) (a) 2 ploughings and 2 *sohaga*. (b) and (c) N.A. (d) 18"×6". (e) N.A. (v) Nil. (vi) Sweet corn (Golden cross bantan). (vii) Irrigated. (viii) Once earthing up and 2 hoeings. (ix) 24.66". (x) 27.9.1952.

2. TREATMENTS :

- Control.
- 50 lb./ac. of N as A/S.
- 100 lb./ac. of N as A/S.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 14'×7.5'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-53. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3178 lb./ac.
 (ii) 366.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1920
2.	3374
3.	4240
S.E./mean	= 183.1 lb./ac.

Crop :- Maize (*Khari*).

Ref :- Pb. 53(174).

Site :- Cereal Breeding Sub-Stn., Katrain.

Type :- 'M'.

Object :—To ascertain the optimum manurial requirement of Maize.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 4.6.1953. (iv) (a) 3 ploughings and 3 *sohaga*. (b) and (c) N.A. (d) 18"×6". (e) N.A. (v) Nil. (vi) Golden cross bantan. (vii) Unirrigated. (viii) Once earthing up and 2 hoeings. (ix) 25.88". (x) End of Sept. 1953.

2. TREATMENTS :

1. Control.
2. 50 lb./ac. of N as A/S.
3. 100 lb./ac. of N as A/S.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 18'×7.5'. (b) 16'×4.5'. (v) 1'×1.5'. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Lasseling, no. of plants/plot, plant height, cob height, cob length, cob circumference and grain yield. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3202 lb./ac.
 (ii) 243.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1245
2.	3656
3.	4706
S.E./mean	= 121.6 lb./ac.

Crop :- Maize (*Kharif*).

Site :- Agri. Stn., Karnal.

Ref :- Pb. 52(133).

Type :- 'M'.

Object :—To study the residual effect of manures applied to previous Wheat crop on subsequent Maize fodder.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 25.6.1952. (iv) (a) 4 ploughings and 4 *sohaga*. (b) N.A. (c) 32 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 31.73". (x) 10.8.1952 to 11.8.1952, 13.8.1952 to 28.8.1952.

2. TREATMENTS :

1. Control (no manure).
 2. 100 lb./ac. of N as A/S applied to previous wheat crop.
 3. 100 lb./ac. of N as Ammo. Phos. applied to previous wheat crop.
 4. 125 lb./ac. of P₂O₅ as Super applied to previous wheat crop.
- Manures applied to previous wheat crop, experiment no. 51(57).

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) 12'×80'. (b) 11'×80'. (v) 1' left on one side of the plots. (vi) Yes. Same randomisation of wheat crop adopted.

4. GENERAL :

- (i) Satisfactory to normal. No lodging. (ii) Nil. (iii) Fodder yield (iv) (a) Not contd. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 9.85 ton/ac.
 (ii) 1.49 ton/ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	8.61
2.	10.04
3.	10.69
4.	10.04
S.E./mean	= 0.43 ton/ac.

Crop :- Maize.

Ref :- Pb. 52(77).

Site :- Chemical Section. B.A. Farm, Rauni.

Type :- 'M'.

Object :- To study the effect of A/S on yield of Maize when applied with F.Y.M. over control.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Rauni (iii) 7.7.1952. (iv) (a) and (b) N.A. (c) 10—12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) One hoeing on 28.8.1952. (ix) 18.30". (x) 10.10.1952.

2. TREATMENTS :

1. Control.
 2. 10 ton/ac. of F.Y.M. + 30 lb./ac. of N as A/S.
 3. 10 ton/ac. of F.Y.M. + 40 lb./ac. of N as A/S.
 4. 10 ton/ac. of F.Y.M. + 50 lb./ac. of N as A/S.
- F.Y.M. broadcast on 24.6.1952 while A/S broadcast on 19.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 80.7' × 27'. (b) 75.75' × 23'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination normal. Crop lodged partially due to heavy rains and winds on 22.8.1952. (ii) Attack of short borer. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1928 lb./ac.
- (ii) 166.7 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1570
2.	1974
3.	2162
4.	2006
S.E./mean	= 83.3 lb./ac.

Crop :- Maize.

Ref :- Pb. 53(111).

Site :- Chemical Section. B.A. Farm, Rauni.

Type :- 'M'.

Object :- To study the effect of F.Y.M. when applied alone and together with A/S on Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) A/S, F.Y.M. and G.N.C. applied. Amount of each and time of application N.A. (ii) (a) Heavy loam. (b) Refer soil analysis, Rauni. (iii) 23.7.1953. (iv) (a) 4 ploughings, 2 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and one earthing up. (ix) 23.69". (x) 26.10.1953.

2. TREATMENTS :

1. Control.
 2. 10 ton/ac. of F.Y.M.
 3. 10 ton/ac. of F.Y.M. + 30 lb./ac. of N as A/S
 4. 10 ton/ac. of F.Y.M. + 40 lb./ac. of N as A/S
 5. 10 ton/ac. of F.Y.M. + 50 lb./ac. of N as A/S
- F.Y.M. broadcast on 8.7.1953 while A/S on 23.7.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 15' × 90'. (b) 12' × 80.66'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Some plants were broken due to high winds. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1944 lb./ac.
 (ii) 286.6 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av yield
1.	1682
2.	1684
3.	2162
4.	2080
5.	2112
S.E./mean	=143.3 lb./ac.

Crop :- Maize.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 51(82).

Type :- 'C'.

Object :- To find the best spacing for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.7.1951. (iv) (a) 5 ploughing and 5 *sohaga*. (b) N.A. (c) 6—8 sr./ac. (d) As per treatments. (e) N.A. (v) 5 tons/ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) 1 gap filling one hoeing cum weeding. (ix) 11.63". (x) 13.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 row to row spacings : $R_1=1'$, $R_2=1.5'$ and $R_3=2'$
 (2) 3 plant to plant spacings : $S_1=9''$, $S_2=12''$ and $S_3=15''$.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) $12' \times 37.81'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Slight borer attack. (iii) Grain and stalk yield. (iv) (a) Not contd. (b) —, (c) —. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1351 lb./ac.
 (ii) 315.1 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	Mean
R_1	1497	1163	1555	1405
R_2	1695	1358	1240	1401
R_3	1253	1441	1046	1247
Mean	1452	1321	1280	1351

S.E. of any marginal mean = 90.9 lb./ac.
 S.E. of body of table = 157.5 lb./ac.

Crop :-Maize (*Kharif*).

Ref :-Pb. 49(20).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'C'.

Object :-To find out the best date of sowing for Maize crop.

1. BASAL CONDITIONS :

(i) Nil. (b) Gram. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 *desi* ploughing, 6 *sohaga* and 1 roller. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 7 lb. N in A/S applied on 10.8.1949, 15.8.1949, 24.8.1949, 24.8.1949 and 8.9.1949 respectively to D₁, D₂, D₃, D₄, D₅. Hoeing cum weeding. (ix) 12.56". (x) 30.9.1949, 6.10.1949, 25.10.1949, 30.10.1949 and 25.11.1949.

2. TREATMENTS :

5 dates of sowing : D₁=15.7.1949, D₂=25.7.1949, D₃=4.8.1949, D₄=11.8.1949 and D₅=21.8.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 11'×104'. (b) 11'×99'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and condition good. No lodging. (ii) N.A. Gammoxene dusted on 30.9.1949. (iii) Grain and stalk yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1023 lb./ac.

(ii) 169.0 lb./ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D ₁	1689
D ₂	1645
D ₃	1033
D ₄	543
D ₅	206
S.E./mean	=69.0 lb./ac.

Crop :-Maize (*Kharif*).

Ref :-Pb. 50(20).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'C'.

Object :-To find best time of sowing for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) One *raja*, 5 *desi hal*, and 7 *sohaga*. (b) to (e) N.A. (v) Compost 6 ton/ac. on 28.6.1950. (vi) Local. (vii) Irrigated. (viii) 2 hoeings, 2 weedings and one gap filling. (ix) 47.04". (x) D₁ : 30.9.1950, D₂ : 16.10.1950, D₃ : 22.10.1950 and D₄ : 30.10.1950.

2. TREATMENTS :

4 dates of sowing : D₁=5.7.1950, D₂=15.7.1950, D₃=26.7.1950 and D₄=4.8.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×90.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good in D₁, D₂ but poor in D₃, D₄ due to rain. Severe lodging occurred due to wind storm on 7.9.1950 and 19.9.1950. (ii) There was attack of borer on the crop. (iii) Grain and stalk yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 695 lb./ac.
 (ii) 148.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield.
D ₁	922
D ₂	1013
D ₃	735
D ₄	111
S.E./mean	=74.1 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 51(79).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To find out the best date of sowing for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c)—. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 5 *desi hal*, 6 *sohaga*, and 1 roller. (b) N.A. (c) N.A. (d) 1' row to row. (e) N.A. (v) 5 ton/ac. of F.Y.M. and A/S at 50 lb./ac. of N to all plots (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 3 weedings. (ix) 11.63°. (x) D₁ : 7.10.1951, D₂ : 15.10.1951, D₃ : 17.10.1951 and D₄ : 22.10.1951.

2. TREATMENTS :

4 dates of sowing : D₁=5.7.1951, D₂=15.7.1951, D₃=25.7.1951 and D₄=4.8.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 12'×82.5'. (b) 12'×75.62'. (v) 3 rows left out on each side. (vi) Yes.

4. GENERAL :

(i) Germination good. Growth good in D₁ and D₂ and satisfactory in D₃ and D₄. No lodging. (ii) Borer attack. (iii) Grain and stalk yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1136 lb./ac.
 (ii) 165.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D ₁	1265
D ₂	1529
D ₃	970
D ₄	778
S.E./mean	= 82.5 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 52(141).

Site :- Cereal Breeding Sub-Stn., Katrain.

Type :- 'C'.

Object :—To find the best date of sowing for the Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings and 2 *sohaga*. (b) N.A. (c) 10 to 15 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) One earthing up and 2 hoeings. (ix) 24.66°. (x) 27.9.1952.

2. TREATMENTS :

3 sowing dates : $D_1=19.5.1952$, $D_2=3.6.1952$. and $D_3=18.6.1952$.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $16' \times 4\frac{1}{2}'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2528 lb./ac.

(ii) 866.3 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D_1	1672
D_2	3520
D_3	2392
S.E./mean	= 433.1 lb./ac.

Crop :- Maize (*Khaif*).

Ref :- Pb. 52 (142).

Site :- Cereal Breeding Sub-Stn., Katrain.

Type :- 'C'.

Object :- To study the effect of plant to plant spacing on yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) 3 ploughings, 3 *sohaga*. (b) and (c) N.A. (d) Row to row 1'; plant to plant : as per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) One earthing up and 2 hoeings. (ix) 24.66". (x) Sept. 1952.

2. TREATMENTS :

1. Spacing between plants = 9".

2. Spacing between plants = 12".

3. Spacing between plants = 15".

4. Spacing between plants = 18".

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $30' \times 8'$. (b) $29' \times 6'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Attacked by stem borer in July. (iii) Grain yield (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2724 lb./ac.

(ii) 535.2 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
S_1	2897
S_2	2728
S_3	2631
S_4	2639
S.E./mean	= 267.6 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 53 (175).

Site :- Cereal Breeding Sub-Stn., Katrain. Type :- 'C'.

Object :- To study the effect of sowing date and spacing on Maize yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 3 ploughings and 3 *sohaga*. (b) and (c) N.A. (d) Row to row 1' and plant to plant as per treatments. (e) N.A. (v) Nil. (vi) Golden cross banton (medium). (vii) Unirrigated. (viii) 2 hoeings and one earthing up. (ix) 25.88". (x) End of Sept. 1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=20.5.1953$, $D_2=4.6.1953$ and $D_3=19.6.1953$.

Sub-plot treatments :

4 plant to plant spacings : $S_1=6"$, $S_2=8"$, $S_3=10"$ and $S_4=12"$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main 25' x 18' sub 25' x 4½' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) No. of plants, plant height, cob weight and grain yield. (iv) (a) 1953 to 1954. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1046 lb./ac.

(ii) (a) 345.0 lb./ac.

(b) 274.1 lb./ac.

(iii) D effect is highly significant, while S effect is significant.

(iv) Av. yield of grain in lb./ac.

	S_1	S_2	S_3	S_4	Mean
D_1	809	846	685	647	747
D_2	933	1307	1531	1643	1354
D_3	846	933	1070	1294	1036
Mean	863	1029	1095	1195	1046

S.E. of difference of two

1. D marginal means = 122.0 lb./ac.

2. S marginal means = 111.9 lb./ac.

3. S means at the same level of D = 193.8 lb./ac.

4. D means at the same level of S = 207.5 lb./ac.

Crop :- Maize.

Ref :- Pb. 48(37).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'.

Object :- To study the effect of N and cultural practices on yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 17.7.1948. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) As per treatments. (ix) 19.65". (x) 29.9.1948.

2. TREATMENTS :

Main-plot treatments :

2 levels of ploughing . $C_1=1$ raja plough and 2 *desi hal* and $C_2=1$ raja plough and 4 *desi hal*.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 hoeings : $H_1=3$ and $H_2=5$ hoeings.

(2) 2 doses of N as A/S and Ammo. Phos. : $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $14' \times 77'-9\frac{1}{2}"$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Grain and stalk yield. (iv) (a) 1952-1953. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1594 lb./ac.
 (ii) (a) 340.6 lb./ac.
 (b) 211.9 lb./ac.
 (iii) H effect is highly significant, N effect is significant while other effects are not significant.
 (iv) Av. yield of grain in lb./ac.

	H_1	H_2	Mean	N_1	N_2
C_1	1463	1792	1627	1625	1630
C_2	1443	1678	1560	1403	1717
Mean	1453	1735	1594		
N_1	1359	1669	1514		
N_2	1546	1801	1673		

S.E. of marginal mean of H or N = 53.0 lb./ac.

S.E. of body of table $H \times N$ = 74.9 lb./ac.

S.E. of difference of two

1. C marginal means = 120.5 lb./ac.

2. H or N means at the same level of C = 105.9 lb./ac.

3. C means at the same level of H or N = 141.8 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 49(14).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'CM'.

Object :- To study the effect of A/S and spacings on yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20.7.1949.
 (iv) (a) 7 *desi hal* and 4 *sohaga*. (b) N.A. (c) 17 sr./ac. (d) Row to row 1' and plant to plant. As per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) One gap filling, 1 thinning and 2 hoeings
 (ix) 12.56". (x) 13,14.10.1949.

2. TREATMENTS :

Main-plot treatments :

5 levels of N : $N_0=0$, $N_1=50$, $N_2=100$, $N_3=150$ and $N_4=200$ lb./ac.

Sub-plot treatments :

5 plant to plant spacings : $S_1=6"$, $S_2=9"$, $S_3=12"$, $S_4=15"$ and $S_5=18"$.

N as A/S applied on 18.8.1949 in N_1 , on 18,23.8.1949 in N_2 , on 18,23,25.8.1949 in N_3 and on 18,23,25,31.8.1949 in N_4 .

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 7'×64.82'. (v) Nil. (vi) Yes.

4. GENERAL

(i) Poor to fair. (ii) Grain and stalk yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1532 lb./ac.
 (ii) (a) 469.6 lb./ac.
 (b) 279.7 lb./ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean
N ₀	806	827	839	734	969	835
N ₁	1282	1479	1426	1201	1432	1364
N ₂	1876	1773	1728	1843	1730	1790
N ₃	1856	2088	2049	1889	1685	1913
N ₄	1753	1837	1670	1882	1656	1760
Mean	1515	1601	1542	1510	1494	1532

S.E. of difference of two

1. N marginal means = 121.3 lb./ac.
2. S marginal means = 72.1 lb./ac.
3. S means at the same level of N = 161.5 lb./ac.
4. N means at the same level of S = 188.6 lb./ac.

Crop :- Maize (*Kharif*).

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 50(22).

Type :- 'C M'.

Object :- To study the effect of A/S and spacing on yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 18.7.1950. (iv) (a) one *raja*, 6 *desi hal*, 6 *sohaga* and one horse hoe. (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) 5 ton/ac. of F.Y.M. on 30.6.1950. (vi) Local. (vii) Irrigated. (viii) 2-3 hoeings ; one thinning. (ix) 47.04%. (x) 13.10.1950.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 plant to plant spacings : S₁=9', S₂=12' and S₃=15'.
- (2) 2 row to row spacings : R₁=1' and R₂=2'.

Sub-plot treatments :

4 levels of N : N₀=0, N₁=50, N₂=100 and N₃=150 lb./ac.
 N as A/S applied half on 25.8.1950 and half on 2.9.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×56.72'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germinated by heavy rain ; gap filling was done where necessary ; lodging due to wind storm. (ii) Severe attack of borer. (iii) Grain and straw yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 992 lb./ac.
 (ii) (a) 266.3 lb./ac.
 (b) 136.4 lb./ac.
 (iii) N and R effects and interaction $R \times S \times N$ are highly significant. Others are not significant.
 (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	R ₁	R ₂
S ₁	456	1005	1203	1599	1016	1073	959
S ₂	572	998	1200	1384	1038	1107	970
S ₃	507	958	1122	1069	921	1063	780
Mean	512	997	1175	1284	992	1081	903
R ₁	514	1064	1322	1425	1081		
R ₂	509	931	1028	1144	903		

S.E. of marginal mean of S	=47.1 lb./ac.
S.E. of marginal mean of N	=38.4 lb./ac.
S.E. of body of table S × R	=72.7 lb./ac.
S.E. of difference of two	
1. N marginal means	=39.4 lb./ac.
2. N means at the same level of S	=68.2 lb./ac.
3. S means at the same level of N	=89.0 lb./ac.
4. N means at the same level of R	=55.6 lb./ac.
5. R means at the same level of N	=72.7 lb./ac.

Crop :- Maize (*Kharif*).

Ref :- Pb. 51(81).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C M'.

Object :- To study the effect of doses of A/S and spacings on yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Maize-Wheat. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 16.7.1951. (iv) (a) one *raja* plough, 5 *desi hal*, 4 *sohaga* and one roller. (b) N.A. (c) 6-8 sr./ac. (d) As under treatments. (e) N.A. (v) 5 ton/ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) One gap filling, one hoeing and weeding. (ix) 11.63". (x) 11.10.1951.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2).

(1) 3 plant to plant spacings : S₁=9". S₂=12" and S₃=15".

(2) 2 row to row spacings : R₁=1' and R₂=2'.

Sub-plot treatments :

4 levels of N : N₀=0, N₁=50, N₂=100 and N₃=150 lb./ac.

N as A/S broadcast along the rows on 16.8 1951.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 8' × 56.72'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Borer attack in some plots in the beginning of August. (iii) Grain and stalk yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1892 lb./ac.
(ii) (a) 714.5 lb./ac.
(b) 270.1 lb./ac.
(iii) Only N and R effects are highly significant.
(iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean	R ₁	R ₂
S ₁	1335	2112	2125	2374	1987	2240	1733
S ₂	1293	1921	2101	2166	1870	2147	1594
S ₃	1197	1649	2214	2217	1819	2194	1444
Mean	1275	1894	2147	2252	1892	2194	1590
R ₁	1462	2203	2465	2644	2194		
R ₂	1088	1585	1828	1861	1590		

S.E. of marginal mean of S	= 126.3 lb./ac.
S.E. of marginal mean of R	= 103.1 lb./ac.
S.E. of body of table S × R	= 178.6 lb./ac.
S.E. of difference of two	
1. N marginal means	= 77.9 lb./ac.
2. N means at the same level of S	= 135.1 lb./ac.
3. S means at the same level of N	= 213.5 lb./ac.
4. N means at the same level of R	= 110.3 lb./ac.
5. R means at the same level of N	= 174.3 lb./ac.

Crop :- Soyabean (*Kharif*).

Ref :- Pb. 49(1).

Site :- Demonstration farm, Kangra.

Type :- 'C'.

Object :- To study the effect of seed rate on yield of Soyabean.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 23.5.1949. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) N-373 (medium). (vii) Irrigated. (viii) 1 weeding. (ix) 42.70°. (x) 19.10.1949.

2. TREATMENTS :

4 seed rates.

- 15 sr./ac.
- 20 sr./ac.
- 25 sr./ac.
- 30 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4, (b) N.A. (iii) 4. (iv) (a) and (b) 48.4' × 9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield. (iv) (a) Not continued. (b) and (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1906 lb./ac.
(ii) 110.7 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of soyabean in lb./ac.

Treatment	Av. yield
1.	1620
2.	1864
3.	1954
4.	2186
S.E./mean	= 55.3 lb./ac.

Crop :- Soyabean (*Kharif*).
Site :- Demonstration farm, Kangra.

Ref :- Pb. 49(2).
Type :- 'C'.

Object :- To study the effect of spacing on yield of Soyabean.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 22.5.1949. (iv) (a) 4 ploughings and 5 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) N-373 (medium). (vii) Irrigated. (viii) One weeding and hoeing. (ix) 42.70". (x) 20,24.10.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 row spacings : $R_1=1'$, $R_2=1\frac{1}{2}'$ and $R_3=2'$.

(2) 3 plant spacings : $S_1=2''$, $S_2=4''$ and $S_3=6''$.

3. DESIGN :

(i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 40.4'x6'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield. (iv) (a) Not continued. (b) and (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 2034 lb./ac.

(ii) 181.5 lb./ac.

(iii) Overall treatments effect is significant. Effects of S and R x S are significant, while effect of R is not significant.

(iv) Av. yield of soyabean in lb./ac.

	R_1	R_2	R_3	Mean
S_1	2149	2172	1918	2080
S_2	2241	2102	2016	2120
S_3	2056	1710	1941	1902
Mean	2149	1995	1958	2034

S.E. of any marginal mean = 52.4 lb./ac.

S.E. of body of table = 90.7 lb./ac.

Crop :- Soyabean.
Site :- Demonstration Farm, Kangra.

Ref :- Pb. 48(2).
Type :- 'CV'.

Object :- To study the effect of seed rate on yield of different varieties of Soyabean.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22.5.1948. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) One weeding. (ix) 28.79". (x) 17.10.1948.

2. TREATMENTS :

Main-plot treatments :

2 varieties : $V_1=N-373$ and $V_2=Mix-94$.

Sub-plot treatments :

4 seed rates : $R_1=15$, $R_2=20$, $R_3=25$ and $R_4=30$ sr./plot.

3. DESIGN :

(i) (a) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 4'x38'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2009 lb./ac.
 (ii) (a) 289.4 lb./ac.
 (ii) 271.4 lb./ac.
 (iii) V and R effects are highly significant.
 (iv) Av. yield of soyabean in lb./ac.

	R ₁	R ₂	R ₃	R ₄	Mean
V ₁	1999	2321	2616	2837	2443
V ₂	1474	1326	1769	1732	1575
Mean	1737	1824	2192	2285	2009

S.E. of difference of two

1. V marginal means = 102.4 lb./ac.
 2. R marginal means = 135.8 lb./ac.
 3. V means at the same level of R = 195.2 lb./ac.
 4. R means at the same level of V = 191.9 lb./ac.

Crop :- Gram.

Site :- Agri. Stn., Ferozepur.

Ref :- Pb. 53(21).

Type :- 'M'.

Object :- To study the effect of applications of Super to Gram crop.

1. BASAL CONDITIONS :

(i) (a) Gram-Bajra-Wheat-Fallow. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 19.10.1953. (iv) (a) 1 *raja* plough, 4 *desi* plough, 8 plankings. (b) *Kera* behind the plough. (c) 1 md. 5 sr /ac. (d) N.A. (e)—. (v) 20 C.L. of F.Y.M. (160 lb. N approx. or 400 mds. of F.Y.M. approx.) applied by method of broadcast. (vi) *Kabuli* gram C-104 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 2.47". (x) 10.4.1954.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac. of P₂O₅ as Super.
 3. 75 lb./ac. of P₂O₅ as Super.
 4. 100 lb./ac. of P₂O₅ as Super.
 Super applied behind the plough before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 80.66'×9'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Germination count, height, dates of flowering and grain yield. (iv) (a) 1953—continued. (b) No. (c) Nil. (v) (a) Rohtak. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1421 lb./ac.
 (ii) 119.4 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1184
2.	1515
3.	1476
4.	1508
S.E./mean	= 48.7 lb./ac.

Crop :- Gram.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 48(63).
Type :- 'M'.

Object :—To study the effect of A/S on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 3.10.1948.
(iv) (a) to (e) N.A. (v) Nil. (vi) Pb. 1.P-58 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.26." (x) 23.3.1949.

2. TREATMENTS :

1. Control (no manure).
2. $1\frac{1}{2}$ md./ac. of A/S.
3. 2 md./ac. of A/S.
A/S applied on 15.1.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) $65' \times 24'$ (b) $54\frac{1}{2}' \times 20'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1283 lb./ac.
(ii) 126.9 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1295
2.	1213
3.	1341
S.E./mean	= 44.9 lb./ac.

Crop :- Gram (*Rabi*).
Site :- Agri. Farm (Soil Sub-Stn.), Rohtak.

Ref :- Pb. 53(160).
Type :- 'M'.

Object :—To find the suitable manurial treatments for Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 7.10.1953. (iv) (a) 4 ploughings and 4 *sohaga*. (b) N.A. (c) 25 sr./ac. (d) and (e) N.A. (v) Nil. (vi) I.P.-58 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.10". (x) 17.4.1954.

2. TREATMENTS :

1. 25 lb./ac. of P_2O_5 as B.M. (uncomposted).
2. 25 lb./ac. of P_2O_5 as B.M. (compost).
3. 25 lb./ac. of P_2O_5 as compost manure.
4. 25 lb./ac. of P_2O_5 as B.M. (uncomposted) + 25 lb./ac. of N as A/S.
5. 25 lb./ac. of P_2O_5 as B.M. compost + 25 lb./ac. of N as A/S.
6. 25 lb./ac. of P_2O_5 as Super.
7. 25 lb./ac. of P_2O_5 as Super + 25 lb./ac. of N as A/S.
8. 50 lb./ac. of P_2O_5 as Super + 25 lb./ac. of N as A/S.
9. Control.
Super applied by pore while other manures by broadcast. A/S applied with 1st irrigation.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Crop damaged due to hail storm. Slight lodging. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2719 lb./ac.
 (ii) 437.3 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2917
2.	2666
3.	2480
4.	2831
5.	2708
6.	2657
7.	2891
8.	3034
9.	2283
S.E./mean	= 218.7 lb./ac.

Crop :- Kabuli Gram.

Ref :- Pb. 53(161).

Site :- Agri. Farm, Soil Sub-Stn., Rohtak.

Type :- 'M'.

Object :- To find the best manure for Kabuli Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) Sept. 1953. (iv) (a) 4-5 ploughings and 5 *sohaga*. (b) *Kera*. (c) 40 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) No. 104 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8.10". (x) 10.4.1954.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 levels of N : $N_0=0$ and $N_1=25$ lb./ac.

(2) 2 levels of P_2O_5 : $P_0=0$ and $P_1=25$ lb./ac.

N as A/S and P_2O_5 as Super. Super was drilled before sowing. A/S added in December.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Hail storm in January 1954 damaged the crop, slight lodging. (ii) Crop severely attacked by white ants. (iii) Grain yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1095 lb./ac.
 (ii) 163.7 lb./ac.
 (iii) Effect of N alone is significant.
 (iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	887	1152	1020
P_1	1081	1260	1171
Mean	984	1206	1095

S.E. of any marginal mean = 57.9 lb./ac.

S.E. of body of table = 81.9 lb./ac.

Crop :- Gram (*Kabuli*).

Ref :- Pb. 53(166).

Site :- Govt. Agri. Farm, Millet Sub, Stn., Rohtak. Type :- 'M'.

Object :- To study the effect of P_2O_5 on Gram (*Kabuli*).

1. BASAL CONDITION :

(i) (a) Nil. (b) Cotton. (c) 203 lb. A/S applied on 7.8.1953. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 4.11.1953. (iv) (a) 1 *raja*, 1 *desi hal*, 1 cultivator, and 3 plankings. (b) Pore. (c) 40 sr./ac. (d) Row to row 1'; plant to plant 3"—6". (e) N.A. (v) Nil. (vi) C-104 (medium). (vii) Irrigated. (viii) One weeding. (ix) 8 10". (x) 14.4.1954.

2. TREATMENTS :

1. Control.
2. 50 lb/ac. of P_2O_5 as Super.
3. 75 lb./ac. of P_2O_5 as Super.
4. 100 lb./ac. of P_2O_5 as Super.

Seed mixed with Super was sown by pore on 4.11.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 60.5'×15'. (b) 60.5'×15'. (v) Nil. (vi) Y.s.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Germination, growth and grain yield. (iv) (a) 1953-1954. (b) No. (c)—. (v) (a) Millet Stn. Ferozepur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1623 lb./ac.
- (ii) 281.5 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1626
2.	1650
3.	1699
4.	1518
S.E./mean	= 114.9 lb./ac.

Crop :- Gram.

Ref :- Pb. 48 (52).

- Site :- Govt. Agri. Stn., Hansi.

Type :- 'C'.

Object :- To study the effect of date of sowing on yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments (iv) (a) N.A. (b) N.A. (c) 6 chk/plot. (d) and (e) N.A. (v) Nil. (vi) T-7 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.71". (x) 19.4.1949.

2. TREATMENTS :

1. Date of sowing 11.10.1948.
2. Date of sowing 22.10.1948.
3. Date of sowing 30.10.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) 79'×13'. (b) 73'-4"×11 (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—. (vi) Nil. (vii) Expt. was planned with 6 replications but data available only for 3 replications.

5. RESULTS :

- (i) 1634 lb./ac.
 (ii) 245.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1858
2.	1685
3.	1358
S.E./mean	= 141.9 lb./ac.

Crop :- Gram.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 48 (24).

Type :- 'C'.

Object :—To study the effect of cultivation practices on yield of Gram.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis. Jullundur. (iii) 1.11.1948
 (iv) (a) and (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 7 (medium). (vii) Rainfed.
 (viii) Nil. (ix) 6.29". (x) 11.4.1949.

2. TREATMENTS :

- Control (ordinary cultivation with country plough).
- Sub-soiling with spade (sub-soiling was done up to 1' with spade).

3. DESIGN :

- (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×49.5'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) Slight attack of wilt. (iii) Grain and straw yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 824.6 lb./ac.
 (ii) 192.68 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	421.7
2.	1227.4
S.E./mean	= 73.66 lb./ac.

Crop :- Gram.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 48(25).

Type :- 'C'.

Object :—To study the effect of cultivation practices on yield of Gram.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 1.11.1948. (iv) (a) and (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 7 (medium). (vii) Unirrigated. (viii) Nil. (ix) 6.29". (x) 22.4.1949.

2. TREATMENTS :

1. Control (ordinary cultivation with country plough).
2. Sub-soiling up 1' with soil inverting plough.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) 6. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Slight attack of wilt. (iii) Grain and straw yield. (iv) (a) No (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 552.9 lb./ac.
- (ii) 110.58 lb./ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	306.9
2.	798.9
S.E./mean	=55.14 lb./ac.

Crop :- Gram (*Rabi*).

Ref :- Pb. 49(15).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To find the best date of sowing Gram.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 *desi hal* and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Pb. 7 (medium). (vii) Unirrigated. (viii) One hoeing cum weeding. (ix) 6.14". (x) 24.4.1950.

2. TREATMENTS :

Dates of sowing :

1. 5.10.1949.
2. 15.10.1949.
3. 25.10.1949.
4. 4.11.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 45'×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Slight attack of wilt. (iii) Grain and straw yield. (iv) (a) No. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment was laid out in 6 replications; yield available for 4 replications.

5. RESULTS :

- (i) 948.9 lb./ac.
- (ii) 186.8 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1332.6
2.	951.5
3.	692.2
4.	819.3
S.E./mean	=93.40 lb./ac.

Crop :- Gram (*Rabi*).
Site :- Agri. Stn., Karnal.

Ref :- Pb. 52(130).
Type :- 'C'.

Object :—To study the effect of cultivation practices on yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 25.9.1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) F.Y.M. applied at 50 lb./ac. of N one month before sowing. (vi) G—24 (medium). (vii) Irrigated. (viii) Only in plots receiving treatment 2 weeding was done. (ix) 3.20". (x) 1.4.1953.

2. TREATMENTS :

1. Control (2 ploughings only).
2. A number of deep ploughings and weedings.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 10. (iv) (a) and (b) 73'—4"×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 494.3 lb./ac.
(ii) 127.08 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	340.7
2.	647.9
S.E./mean	=40.19 lb./ac.

Crop :- Gram.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 48(58).
Type :- 'C'.

Object :—To study optimum date of sowing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. P. 58. (medium). (vii) Unirrigated. (viii) 1 weeding cum hoeing. (ix) 0.26". (x) 26.3.1949.

2. TREATMENTS :

Sowing dates.

1.	2.10.1948
2.	10.10.1948
3.	18.10.1948
4.	26.10.1948
5.	3.11.1948

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 66'×20'. (b) 60½'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1943 to 1948. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1680 lb./ac.
- (ii) 227.3 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1831
2.	1841
3.	1882
4.	1558
5.	1286
S.E./mean	92.8 lb./ac.

Crop :- Gram.

Ref :- Pb. 48(59).

Site :- Agri. Farm, Rohtak,

Type :- 'C'.

Object :- To study effect of sub-soiling due to bullock labour on yield of Gram.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 23.10.1948.
- (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 1.P-58 (medium). (vii) Unirrigated.
- (viii) 1 weeding cum hoeing. (ix) 0.26". (x) 26.3.1949.

2. TREATMENTS :

- 1. Control.
- 2. Sub-soiling (by block labour).

3. DESIGN :

- (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 1/20 ac. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) Nil (c) Nil (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1240 lb./ac.
- (ii) 150.7 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1219
2.	1260
S.E./mean	= 61.5 lb./ac.

Crop :- Gram.

Ref :- Pb. 49(88)

Site :- Agri. Farm, Rohtak.

Type :- 'C'.

Object :- To study the effect of sub-soiling due to bullock labour on yield of Gram.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 10.10.1949. (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 1.P-58 (medium). (vii) Unirrigated. (viii) 1 weeding cum hoeing. (ix) 2.15". (x) 4.4.1950.

2. TREATMENTS :

1. Control.
2. Sub-soiling (done by bullock labour).

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 18'×121'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) 1948 to 1949. (b) No (c) Nil (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1444 lb./ac.
- (ii) 38.7 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1447
2.	1440
S.E./mean	= 15.8 lb./ac.

Crop :- Gram.

Ref :- Pb. 48(60).

Site :- Agri. Farm, Rohtak.

Type :- 'C'.

Object :—To study the effect of sub-soiling by manual labour (with spade) on yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 23-10.1948, (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) N.A. (e) N.A. (v) N.A. (vi) Pb. 1.P. 58(medium). (vii) Unirrigated. (viii) 1 weeding cum hoeing. (ix) 0.26". (x) 26.3.1949.

2. TREATMENTS :

1. Control.
2. Sub-soiling by manual labour (with spade).

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 11'×49.5'. (b) 11'×49.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1193 lb./ac.
- (ii) 202.6 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1234
2.	1152
S.E./mean	= 82.7 lb./ac.

Crop :- Gram.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 49(87).
Type :- 'C'.

Object :-To study the effect of Sub-soiling due to manual labour (by spade) on yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 17.10.1949. (iv) (a) and (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) N.A. (vi) Pb. 1-P.58. (vii) Unirrigated. (viii) One weeding cum hoeing (ix) 2.15". (x) 5.4.1950.

2. TREATMENTS :

1. Control.
2. Sub-soiling (manual labour by spade).

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 11'×49½'. (b) 11'×49½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1529 lb./ac.
- (ii) 123.0 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1618
2.	1440
S.E./mean	= 50.2 lb./ac.

Crop :- Gram.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 50(99).
Type :- 'C'.

Object :-To study the effect of cultivation practices on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 12.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) Pb. I. P.58 (medium). (vii) Unirrigated. (viii) Nil. (ix) 1.83". (x) 13.3.1951.

2. TREATMENTS :

1. Control.
2. *Desi hal* after *desi hal*.
3. *Rajah* plough after ridger.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 60½'×18' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) No. (c)—. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1248 lb./ac.
- (ii) 150.2 lb./ac.
- (iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1262
2.	1296
3.	1186
S.E./mean	= 61.3 lb./ac.

Crop :- Gram.

Ref :- Pb. 52(105).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CV'.

Object :—To study the effect of dates of sowing different varieties on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 11 *desi* plough, 6 *sohaga*, 4 roller, 2 bar harrow. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 1.86%. (x) 24.3.1953 to 30.3.1953.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =Pb. 7 (medium), V_2 =G 24 (medium).

Sub-plot treatments :

3 dates of sowing : D_1 =26.9.1952, D_2 =26.10.1952, and D_3 =10.11.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 54'-5" × 10'. (b) 54'-5" × 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1579 lb./ac.

(ii) (a) 529.9 lb./ac.

(b) 347.9 lb./ac.

(iii) Only dates of sowing are significantly different.

(iv) Av. yield of grain in lb./ac.

	V_1	V_2	Mean
D_1	2097	1359	1728
D_2	1737	1783	1760
D_3	1271	1227	2249
Mean	1702	1456	1579

S.E. of difference of two

- | | |
|----------------------------|----------------|
| 1. V marginal means | =216.3 lb./ac. |
| 2. D marginal means | =173.8 lb./ac. |
| 3. D means at a level of V | =247.0 lb./ac. |
| 4. V means at a level of D | =295.2 lb./ac. |

Crop :- Gram.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 53 (122).
Type :- 'CV'.

Object :—To study the effect of dates of sowing different varieties on the yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As under treatments. (iv) (a) 1 *raja*, 4 to 5 *desi* plough and 6 to 9 *sohaga*. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Nil. (viii) Nil. (ix) 4.50". (x) 15, 18.4.1954.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=Punjab 7 (medium) and V₂=G-24 (medium).

Sub-plot treatments :

3 dates of sowing : D₁=25.9.1953, D₂=12.10.1953 and D₃=27.10.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 54'-6"×10'. (b) 54'-6"×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS

(i) 2623 lb./ac.

(ii) (a) 267.3 lb./ac.

(b) 226.0 lb./ac.

(iii) Main-plot treatments are highly significantly different. Sub-plot treatments are significantly different while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	Mean
D ₁	2114	2554	2334
D ₂	2659	2913	2786
D ₃	2515	2985	2750
Mean	2429	2817	2623

S.E. of difference of two

1. V marginal means =109.2 lb./ac.
2. D marginal means =113.0 lb./ac.
3. D means at a level of V =159.8 lb./ac.
4. V means at a level of D =170.1 lb./ac.

Crop :- Gram.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 52 (106).
Type :- 'I'.

Object :—To find the best time of irrigation for Gram crop.

I. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.10.1952. (iv) (a) 5 *desi* plough, 4 roller, 5 *sohaga* and 2 bar harrow. (b) N.A. (c) 20 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Punjab 7 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86". (x) 24.3.1953,

2. TREATMENTS :

1. No irrigation.
2. 3" *Rauni* (presowing).
3. 3" irrigation in December, 1952.
4. 3" irrigation in February, 1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 54'-5" × 10'. (b) 54'-5" × 16'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2491 lb./ac.
 (ii) 201.8 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2664
2.	2506
3.	2208
4.	2585
S.E./mean	= 82.4 lb./ac.

Crop :- *Mash*.

Ref :- Pb. 53(77).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of application of Super on yield of *Mash*.

1. BASAL CONDITIONS :

- (i) (a) Not followed. (b) Maize-Bajra-Fodder. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 27.7.1953. (iv) (a) 2 ploughings and 2 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) 1' × 1'. (e) N.A. (v) Nil. (vi) *Mash* 48 (medium). (vii) Unirrigated. (viii) Nil. (ix) 21.43". (x) 13.11.1953.

2. TREATMENTS :

1. Control.
 2. 50 lb./ac. of P₂O₅ as Super.
 3. 100 lb./ac. of P₂O₅ as Super.
- Super applied on 27.7.1953 by broadcast before sowing.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 72' × 14'. (b) 60'-11 $\frac{1}{2}$ " × 14'. (v) Approximately 3' left as non experimental area on two sides. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Grain yield only. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 242.1 lb./ac.
 (ii) 57.14 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	245.0
2.	249.4
3.	231.9
S E./mean	= 23.3 lb./ac.

Crop :- Cowpeas.

Ref :- Pb. 53(53).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :—To study the response of Cowpeas, for seed, to phosphatic fertilizer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sudan grass. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 18.7.1953. (iv) (a) 2 *raja* ploughing, 1 *desi* ploughing, 1 planking and 3 horse hoe. (b) N.A. (c) 4½ sr./ac. (d) 3" apart. (e) N.A. (v) F.Y.M. at 8 C.L. applied by method of broadcast on 8.6.1953. (vi) Cowpeas Fos. No. 1 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 15.67". (x) 13.12.1953.

2. TREATMENTS :

1. No fertilizer.
 2. 30 lb./ac. of P₂O₅ as Super.
 3. 60 lb./ac. of P₂O₅ as Super.
- Fertilizers applied by method of broadcast on 18.7.1953 before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) and (b) 27' × 132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Slight attack of Aphis. D.D.T. (one lb.) sprayed on 14.9.1953. (iii) Individual plot yield. (iv) (a) 1953—1954. (b) and (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Germination good ; good vegetation growth but seed setting poor.

5. RESULTS :

- (i) 597.6 lb./ac.
 (ii) 78.6 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of cowpeas in lb./ac.

Treatment	Av. yield
1.	582.4
2.	576.6
3.	633.7
S.E./mean	=55.80 lb./ac.

Crop :- Potato (*Rabi*).

Ref :- Pb. 49(23).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To find the effect of A/S and F.Y.M. on the yield of Potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 30.9.1949. (iv) (a) 6 *desi hal* and 8 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) *Surkha*. (vii) Irrigated. (viii) One covering, 2 hoeing and one weeding. (ix) 3.97". (x) 15.2.1950.

2. TREATMENTS :

1. No manure.
 2. 100 lb./ac. of N as F.Y.M.
 3. 100 lb./ac. of N as A/S.
- A/S applied on 16.10.1949 in between the lines.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 10. (iv) (a) and (b) 16' × 8.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Condition good. No lodging. (ii) Nil. (iii) Potato yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Experiment during 1950 was not conducted.

5. RESULTS :

- (i) 2423 lb./ac.
 (ii) 268.8 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	2264
2.	2253
3.	2753
S.E./mean	=85.0 lb./ac.

Crop :- Potato (*Rabi*).

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 51(90).

Type :- 'M'.

Object :—To study the effect of A/S and F.Y.M. on the yield of Potato crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 1, 2.10.1951. (iv) (a) 1 *raja* plough, 5 *desi* hal, 6 *sohaga* and 1 roller. (b) to (e) N.A. (v) Nil. (vi) Patna *surkha* (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 2.31". (x) 10 to 15.2.1952.

2. TREATMENTS :

1. Control.
 2. F.Y.M. at 100 lb./ac. of N.
 3. A/S at 100 lb./ac. of N.
 Date of application N.A.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 16' × 8.5'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination and condition good. No lodging. (ii) Nil. (iii) Potato yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment during 1950 not conducted.

5. RESULTS :

- (i) 13164 lb./ac.
 (ii) 1136.6 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	11497
2.	11769
3.	16225
S.E./mean	=508.3 lb./ac.

Crop :- Potato.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52(64).

Type :- 'M'

Object :—To study the effect of N as A/S and F.Y.M. on Potato crop.

1. BASAL CONDITIONS :

- (i) (a) Not followed. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 30.9.1952. (iv) (a) 2 *desi* hal and 4 *sohaga*. (b) N.A. (c) 10 md. 10 sr./ac. (d) 2½' row to row. (e) N.A. (v) Nil. (vi) Patna red (medium). (vii) Irrigated. (viii) One hoeing and one earthing up. (ix) 3.1". (x) 16.2.1953.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as A/S.

F.Y.M. applied on 13, 14.9.1952 before sowing. A/S applied after germination in two equal doses on 26.10.1952. and 26.11.1952.

3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 51'×9'. (b) 42'×9'. (v) Two rows on each side of length as non-experimental area. (vi) Yes.

4. GENERAL :

(i) Germination and stand good. Poor yield because of Virus attack. No lodging. (ii) Virus attack about 3% damage on 2.11.1952., spraying with Borodiux. (iii) Potato yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) Nil. (vii) Experiment during the year 1950 not conducted.

5. RESULTS :

- (i) 5722 lb./ac.
- (ii) 631.0 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	3746
2.	4124
3.	9297
S.E./mean	= 257.6 lb./ac.

Crop :- Potato.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 51(91).

Type :- 'M'.

Object :—To study the effect of balanced doses of N, P₂O₅ and K₂O on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 2.10.1951. (iv) (a) One raja, 5 desi hal, 6 sohaga and one roller. (b) to (e) N.A. (v) Nil. (vi) Patna Surkh a (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 2.31". (x) N.A.

2. TREATMENTS :

1. Control.
 2. A/S at 56.25 lb./ac. of N+Super at 11.25 lb./ac. of P₂O₅+Pot. Sul. at 20.50 lb./ac. of K₂O.
 3. A/S at 84.375 lb./ac. of N+Super at 16.875 lb./ac. of P₂O₅+Pot. Sul. at 30.75 lb./ac. of K₂O.
 4. A/S at 112.50 lb./ac. of N+Super at 22.50 lb./ac. of P₂O₅+Pot. Sul. at 41.00 lb./ac. of K₂O.
 5. A/S at 140.625 lb./ac. of N+Super at 28.125 lb./ac. of P₂O₅+Pot. Sul. at 51.25 lb./ac. of K₂O.
 6. A/S at 168.75 lb./ac. of N+Super at 33.75 lb./ac. of P₂O₅+Pot. Sul. at 61.50 lb./ac. of K₂O.
 7. A/S at 196.875 lb./ac. of N+Super at 39.375 lb./ac. of P₂O₅+Pot. Sul. at 71.75 lb./ac. of K₂O.
 8. A/S at 225.0 lb./ac. of N+Super at 45.00 lb./ac. of P₂O₅+Pot. Sul. at 82.00 lb./ac. of K₂O.
- Time and method of application N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 18.15'×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Potato yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 11026 lb./ac.
- (ii) 1430.6 lb./ac.
- (iii) Treatments are highly significantly different.

(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	8726
2.	9553
3.	10431
4.	11160
5.	10603
6.	11404
7.	11871
8.	14456
S.E./mean	= 584.0 lb./ac.

Crop :- Potato.

Ref :- Pb. 52(60).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of balanced doses of N, P₂O₅ and K₂O on the yield of Potato crop.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Wheat. (c) 40 lb./ac. of N as A/S. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 6.2.1952. (iv) (a) 1 *raja* plough, 6 *desi* plough, 4 plankings and 1 *sohaga*. (b) N.A. (c) 12 md./ac. (d) 2' approximately. (e) N.A. (v) Nil. (vi) *Gola* (medium). (vii) Irrigated. (viii) 2 hoeings, 1 weeding and 1 earthing up. (ix) 6.67". (x) 18 and 19.5.1952.

2. TREATMENTS :

- Control.
 - 56.25 lb./ac. of N+11.25 lb./ac. of P₂O₅+20.50 lb./ac. of K₂O.
 - 84.375 lb./ac. of N+16.875 lb./ac. of P₂O₅+30.75 lb./ac. of K₂O.
 - 112.50 lb./ac. of N+22.50 lb./ac. of P₂O₅+41.00 lb./ac. of K₂O.
 - 140.625 lb./ac. of N+28.125 lb./ac. of P₂O₅+51.25 lb./ac. of K₂O.
 - 168.75 lb./ac. of N+33.75 lb./ac. of P₂O₅+61.50 lb./ac. of K₂O.
 - 196.875 lb./ac. of N+39.375 lb./ac. of P₂O₅+71.75 lb./ac. of K₂O.
 - 225.00 lb./ac. of N+45.00 lb./ac. of P₂O₅+82.00 lb./ac. of K₂O.
- N as A/S applied on 29.2.1953 by broadcast in rows. P₂O₅ as Super applied before sowing. K₂O as Pot. Sul applied by broadcast in rows.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 18.15' x 12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Disease N.A. Dusting with B.H.C. on 20.2.1953. Gammexene dusting. (iii) Yield. of potato (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1347 lb./ac.
(ii) 567.4 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	1666
2.	1255
3.	1173
4.	1286
5.	1250
6.	1121
7.	1275
8.	1749
S.E./mean	= 253.8 lb./ac.

Crop :- Potato (*Rabi*).

Ref :- Pb. 53(90).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of balanced doses of N, P₂O₅ and K₂O on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Berseem. (c) A/S at 50 lb./ac. of N+Super at 50 lb./ac. of P₂O₅. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 7.11.1953. (iv) (a) 10 *desi* plough, 1 horse hoe and 2 *sohaga* (b) N.A. (c) 8 md. 20 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) Patna Red (medium). (vii) Irrigated. (viii) 2 earthing up and 1 hoeing. (ix) 10.33". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N : N₀=0, N₁=100, N₂=150 and N₃=200 lb./ac.(2) 3 levels of K₂O : K₀=0, K₁=40 and K₂=80 lb./ac.

Sub-plot treatments :

3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac.N as A/S, P₂O₅ as Super and K₂O as Pot. Sul. half A/S applied on 6.10.1953 while other half on 19.11.1953. Pot. Sul. on 19.11.1953 and Super on 6.10.1953 by broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 12 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iv) (a) Main : 40' × 17½'. Sub : 40' × 5½'. (b) Sub : 36' × 5½'. (v) Two rows 9" apart on each side as non experimental. (vi) Yes.

4. GENERAL :

(i) Germination fair, condition satisfactory. No lodging. (ii) D.D.T. sprayed on 28.11.1953. Record does not show any attack of pest or disease. (iii) Yield of potato. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 5852 lb./ac.

(ii) (a) 1326.6 lb./ac.

(b) 633.1 lb./ac.

(iii) N and K₂O effects are highly significant. Main × Sub-plot interaction is not significant. P₂O₅ effect is significant.

(iv) Av. yield of potato in lb./ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	4962	5028	5167	5052	4761	4863	5532
N ₁	6039	5954	6586	6193	6037	5989	6553
N ₂	6317	6324	6569	6404	5810	6374	7027
N ₃	6048	5476	5758	5761	5353	5358	6572
Mean	5841	5695	6020	5852	5490	5646	6421
K ₀	5528	5243	5700	5490			
K ₁	5595	5532	5811	5646			
K ₂	6401	6311	6550	6421			

S.E. of difference of two

1. N marginal means = 312.6 lb./ac.
 2. K marginal means = 270.8 lb./ac.
 3. P marginal means = 129.2 lb./ac.
 4. P means at the same level of N = 258.5 lb./ac.
 5. N means at the same level of P = 377.2 lb./ac.
 6. P means at the same level of K = 223.8 lb./ac.
 7. K means at the same level of P = 326.7 lb./ac.
- S.E. of body of N × K table = 383.0 lb./ac.

Crop :- Potato.

Ref :- Pb. 52 (78).

Site :- Chemical Section, B.A. Farm, Rauni.

Type :- 'M'.

Object :—To study the effect of different doses of A/S on yield of Potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 29.10.1952. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) Compost at 10 ton/ac. on 18.9.1952. (vi) Local (medium). (vii) Irrigated. (viii) One hoeing. (ix) 2 15". (x) 21.2.1953.

2. TREATMENTS :

1. Control.
 2. 3 md./ac. of A/S.
 3. 4 md./ac. of A/S.
 4. 5 md./ac. of A/S.
- A/S applied on 5.1.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 16.5'×44'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination poor to fair. No lodging. (ii) Nil. (iii) Yield of potato. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2654 lb./ac.
 (ii) 1009.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of potato in lb./ac.

Treatment	Av. yield
1.	2114
2.	2864
3.	2191
4.	3448
S.E./mean	= 504.8 lb./ac.

Crop :- Potato (*Rabi*).

Ref :- Pb. 53 (91).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To study the best seed size with suitable spacing for Potato crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 9.10.1953. (iv) (a) One *raja* plough, 6 *desi* plough and 4 *sohaga*. (b) N.A. (c) 5 to 12 md./ac. (d) As per treatments. (e) N.A. (v) 16 C.L. of F.Y.M. on 7 and 8.9.53 to the experimental area. (vi) Patna red (medium). (vii) Irrigated. (viii) 4 hoeings and 2 earthing up. (ix) 10.33". (x) 12.2.1954.

2. TREATMENTS :

Main-plot treatments :

4 spacings between plants : $R_1=4''$, $R_2=6''$, $R_3=8''$ and $R_4=10''$.

Sub-plot treatments :

4 seed sizes : $S_1=0.5''$, $S_2=0.75''$, $S_3=1.0''$ and $S_4=1.25''$.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Main : 12'×44'. Sub : 12'×11'. (v) No. (vi) Yes.

4. GENERAL :

(i) Germination fair. Condition satisfactory except in S_1 plots. No lodging. (ii) Sprayed with D.D.T. on 26.11.1953. Records do not show any disease etc. (iii) Yield of Potato. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 13028 lb./ac.
 (ii) (a) 2423.8 lb./ac.
 (b) 2300.3 lb./ac.
 (iii) Main effects are highly significant while interaction is not significant.
 (iv) Av. yield of potato in lb./ac.

	S_1	S_2	S_3	S_4	Mean
R_1	7987	15486	18138	21129	15685
R_2	6555	13683	14913	17120	13068
R_3	7934	12050	13397	15518	12225
R_4	8125	10289	10480	15646	11135
Mean	7650	12877	14232	17353	13028

S.E. of difference of two

1. R marginal means = 856.9 lb./ac.
2. S marginal means = 813.2 lb./ac.
3. S means at the same level of R = 1626.6 lb./ac.
4. R means at the same level of S = 1648.8 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 51(116).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find the manurial requirements of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.6.1951, (iv) (a) 3 *desi* ploughings and 2 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) V-3 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 12.13". (x) 28 to 30.11.1951 and 1.12.1951.

2. TREATMENTS :

1. Control
 2. 50 lb./ac. of N as A/S.
 3. 50 lb./ac. of N as A/S+62.5 lb./ac. of P_2O_5 as Super.
 4. 100 lb./ac. of N as A/S.
 5. 100 lb./ac. of N as A/S+125 lb./ac. of P_2O_5 as Super.
- Time and method of application N.A.

3. DESIGN :

(i) R B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24' x 11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil

5. RESULTS :

- (i) 5813 lb./ac.
 (ii) 273.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	3309
2.	534
3.	6576
4.	7255
5.	6789
S.E./mean	= 136.6 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 52(144).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find the manurial requirements of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 21.6.1952, and 25.6.1952. (iv) (a) 2 *desi* ploughings 1 cultivator and 3 *sohaga*. (b) and (c) N.A. (d) 3' row to row; 1' plant to plant. (e) N.A. (v) 10 ton/ac. of F.Y.M. applied in 2 replications only. Date N.A. (vi) V-2 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 26.27". (x) 12.11.1952 and 18.11.1952.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac. of N.(2) 3 levels of K_2O : $K_0=0$, $K_1=80$, and $K_2=160$ lb./ac. K_2O .

Sub-plot treatments :

2 levels of P_2O_5 : $P_0=0$, $P_1=80$ lb./ac. P_2O_5 .N as A/S, P_2O_5 as Super and K_2O as Pot. sul.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $24' \times 15'$. (b) $22' \times 9'$. (v) One row on either side of plot and one plant on either end of row discarded. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 13997 lb./ac.

(ii) (a) 1673.1 lb./ac.

(b) 1639.6 lb./ac.

(iii) N and K_2O effects are highly significant while other effects and interactions are not significant.

(iv) Av. yield of sweet potato in lb./ac.

	P_0	P_1	Mean	K_0	K_1	K_2
N_0	12182	13294	12738	11993	12927	13294
N_1	14218	14746	14482	13379	15359	14709
N_2	14407	15138	14772	13521	15578	15218
Mean	13602	14393	13997			
K_0	12898	13030	12964			
K_1	14143	15100	14621			
K_2	13766	15048	14407			

S.E. of difference of two

1. N or K marginal means

=482.9 lb./ac.

2. P marginal means

=386.4 lb./ac.

3. P means at the same level of N or K

=669.4 lb./ac.

4. N or K means at the same level of P

=672.2 lb./ac.

S.E. of body of $N \times K$ table

=591.6 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 51(117).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To study the effect of spacings on the yield of Sweet Potato.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy (Poor field). (b) Refer soil analysis, Jullundur. (iii) 25.6.1951.
 (iv) (a) 1 *raja* ploughing, 2 *desi*-and 3 *sohaga*. (b) to (e) N.A. (v) 10 ton/ac. of F.Y.M. Super at 62½ lb./ac. of P₂O₅ and A/S at 50 lb./ac. of N. (vi) B-4306 (V-1) (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 12.13". (x) 4 to 7.12.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 levels of row spacings : R₁=2', R₂=3' and R₃=4'.
 (2) 3 levels of plant spacings : S₁=1', S₂=1½' and S₃=2'.

3. DESIGN :

- (i) 3×3. Fact in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2895 lb./ac.
 (ii) 383.3 lb./ac.
 (iii) Main effects of R and S are highly significant while interaction is not significant.
 (iv) Av. yield of sweet potato in lb./ac.

	S ₁	S ₂	S ₃	Mean
R ₁	3695	3573	2878	3384
R ₂	3967	2800	2411	3059
R ₃	2528	2334	1867	2243
Mean	3397	2904	2385	2895

S.E. of any marginal mean = 110.7 lb./ac.

S.E. of body of table = 191.7 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 52(145).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To study the effect of methods of planting and spacings on the yield of Sweet Potato.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat (for two reps. and fallow (for other two replications). (c) Nil. (ii) (a) Loam in 2 reps. and Sandy loam in other 2 reps. (b) Refer soil analysis, Jullundur. (iii) 30.6.1952 to 7.7.1952. (iv) (a) 2 *desi* plough 2 cultivators and 3 *sohaga*. (b) to (e) N.A. (v) Super at 62½ lb./ac. of P₂O₅ applied before sowing. Date N.A. (vi) V—2 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 26.27". (x) 25-28.11.1952.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 3 levels of row spacings : R₁=1', R₂=2' and R₃=3'.
 (2) 2 methods of plantings : M₁=planted on beds and M₂=planted in furrows.

Sub-plot treatments :

- 3 levels of plant spacings : S₁=6", S₂=9" and S₃=12".

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main : 36' × 22' Sub : 12' × 22' = 1/165th ac. (v) One row on either side of main-plot and one plant of each row was planted as non-experimental. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 14030 lb./ac.

(ii) (a) 3130.1 lb./ac.

(b) 1823.8 lb./ac.

(iii) Overall main-plot treatment effect is not significant but row spacing effect is significant. Other effects are not significant.

(iv) Av. yield of sweet potato in lb./ac.

	R ₁	R ₂	R ₃	Mean	M ₁	M ₂	Mean
S ₁	14892	14829	13450	14390	14412	14369	14390
S ₂	16208	14086	12326	14207	14680	13733	14207
S ₃	15041	13535	11901	13492	13747	13238	13492
Mean	15380	14150	12559	14030			
M ₁	16095	14072	12672	14280			
M ₂	14666	14228	12446	13780			
Mean	15380	14150	12559	14030			

S.E. of difference of two

1. R marginal means = 903.4 lb./ac.

2. M marginal means = 737.7 lb./ac.

3. S marginal means = 526.4 lb./ac.

4. S means at the same level of M = 744.5 lb./ac.

5. M means at the same level S = 956.0 lb./ac.

6. S means at the same level of R = 911.9 lb./ac.

7. R means at the same level of S = 1170.8 lb./ac.

S.E. of body of R × M table = 903.6 lb./ac.

Crop :- Sweet Potato.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52(150).

Type :- 'C'.

Object :- To study the effect of methods of sowing on the yield of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.7.1952. (iv) (a) 2 desi, 1 cultivator and 2 sohaga. (b) to (e) N.A. (v) Super at 62½ lb./ac. of P₂O₅. (vi) N.A. (vii) Irrigated. (viii) 2 hoeings. (ix) 26.27". (x) 5.1.1953.

2. TREATMENTS :

1. Crop sown flat.

2. Crop sown on ridges.

3. DESIGN

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22'x12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. (ii) No. (iii) Yield of sweet potato. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 5707 lb./ac.

(ii) 748.6 lb./ac.

(iii) Treatments are significantly different.

(iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	5855
2.	5558
S.E./mean	=374.3 lb./ac.

Crop :-Sweet Potato.

Ref :-Pb. 53(222).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'C'.

Object :-To study the effect of methods of planting on the yield of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iv) (a) 3 *desi* plough and 2 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) V-2 (medium). (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 24.96'. (x) 18.2.1954.

2. TREATMENTS :

1. Planting in vertical position.
2. Planting in horizontal position.

3. DESIGN :

(i) Paired plots. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/12th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 17943 lb./ac.

(ii) 3993.0 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	18731
2.	17154
S.E./mean	=1630.1 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 53(223).

Site :- Jullundur Agri. Stn., Jullundur

Type :- 'M'.

Object :—To study the effect of different portions of vines used as seed on the yield of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 22.7.1953.
 (iv) (a) 3 *desi* plough and 2 *sohaga*. (b) to (e) N.A. (v) 50 lb./ac. of N as A/S. (vi) V-2 (medium).
 (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) 24.96". (x) 7.2.1954.

2. TREATMENTS :

1. Planting upper portion of vine.
2. Planting middle portion of vine.
3. Planting lower portion of vine.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/165th ac. (v) N.A. (vi) Yes,

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—.
 (vi) and (vii) Nil.

5. RESULTS :

- (i) 12634 lb./ac.
 (ii) 2027.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	14115
2.	12502
3.	11286
S.E./mean	= 827.7 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 51(112).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To find the optimum date of sowing Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Radish and Turnip seed crop. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur.
 (iii) As per treatments. (iv) (a) 2 *desi* ploughings and 2 *sohaga*. (b) to (e) N.A. (v) Super at 62½ lb./ac. of P₂O₅ before sowing. A/S at 25 lb./ac. of N. (vi) Local. (vii) Irrigated. (viii) 4 hoeings. (ix) 12.13".
 (x) 22, 24, 26 and 27 11.1951.

2. TREATMENTS :

Crop sown on : D₁=15.5.1951, D₂=30.5.1951, D₃=15.6.1951, D₄=30.6.1951, D₅=15.7.1951 and
 D₆=30.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 7574 lb./ac.
 (ii) 1580.8 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
D ₁	13379
D ₂	9459
D ₃	7965
D ₄	6161
D ₅	4543
D ₆	3936
S.E./mean	= 790.4 lb./ac.

Crop :- Sweet Potato.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52 (148).

Type :- 'C'.

Object :- To find the optimum date of sowing Sweet Potato.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Sorghum (*Jowar*). (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur.
 (iii) As per treatments. (iv) (a) 3 *desi* plough and 3 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) V-3 (medium).
 (vii) Irrigated. (viii) 3 to 7 hoeings. (ix) 26.27". (x) 22 and 23.4.1952.

2. TREATMENTS :

Crop sown on : D₁= 30.3.1952, D₂=15.4.1952, D₃=30.4.1952, D₄=15.5.1952, D₅=30.5.1952 and D₆=15.6.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27' × 12'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair to normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1951 to 1952. (b) No. (c) Nil.
 (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5877 lb./ac.
 (ii) 613.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
D ₁	8297
D ₂	7744
D ₃	6914
D ₄	5047
D ₅	3872
D ₆	3388
S.E./mean	=306.6 lb./ac.

Crop :- Sweet Potato.

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 52 (152).

Type :- 'C'.

Object :- To find the effect of pruning vines on yield Sweet Potato.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.7.1952.
 (iv) (a) 2 *desi*, 1 cultivator and 2 *sohaga*. (b) to (e) N.A. (v) Super at 62½ lb./ac. in P₂O₅. Date N.A.
 (vi) V-3 (medium). (vii) Irrigated. (viii) 2 hoeings. A/S at 50 lb./ac. of N applied on 6.8.1952. (ix) 26.27".
 (x) 8 and 9.1.1953.

2. TREATMENTS :

1. Vines not pruned.
2. Vines pruned and length of vines kept 1'.
3. Vines pruned and length of vines kept 2'.
4. Vines pruned and length of vines kept 3'.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination good, condition fair. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5240 lb./ac.
 (ii) 776.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	6958
2.	3225
3.	4837
4.	5940
S.E./mean	= 388.1 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 53(221).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To find the effect of pruning vines on yield of Sweet Potato.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 25.4.1953. (iv) (a) 3 *desi* plough and 2 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) V-2 (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 24.96%. (x) 15.12.1953.

TREATMENTS :

1. Vines not pruned.
2. Vines pruned at 3'.
3. Vines pruned at 2'.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/242th ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1952-1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 11740 lb./ac.
 (ii) 5236.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	18233
2.	9670
3.	7318
S.E./mean	= 2618.3 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 52(151).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To study the effect on yield of Sweet Potato when the vines are disturbed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jullundur. (iii) 26.7.1952. (iv) (a) 2 *desi*, 1 cultivator and 2 *sohaga*, (b) to (e) N.A. (v) Super at 62½ lb./ac. of P₂O₅. (vi) V-3 (medium). (vii) Irrigated. (viii) 2 hoeings (ix) 26.27". (x) 7.1.1953.

2. TREATMENTS :

1. Vines disturbed.
2. Vines not disturbed.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22' × 12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good, condition fair. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1952—1953. (b) Nil. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4222 lb./ac.
 (ii) 151.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	3861
2.	4582
S E./mean	=75.5 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 53(220).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To study the effect on yield of Sweet Potato when the vines are disturbed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 8.7.1953. (iv) (a) 3 *desi* plough and 2 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) V—2 (medium). (vii) Irrigated. (viii) 2 hoeings and weeding. (ix) 24.96". (x) 22.2.1954.

2. TREATMENTS :

1. Vines disturbed (not allowed to fix roots at aerial nodes).
2. Vines not disturbed.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/121th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15059 lb./ac.
 (ii) 2485.8 lb./ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of sweet potato in lb./ac.

Treatment	Av. yield
1.	14893
2.	15225
S.E./mean	=1014.8 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 53(225).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To find the best sowing and harvesting dates.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 ploughings and 3 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) V-2 (medium). (vii) Irrigated. (viii) N.A. (ix) 24.96". (x) As per treatments.

2. TREATMENTS :

Main-plot treatments :

6 dates of sowing : $D_1=30\text{th April}$; $D_2=15\text{th May}$, $D_3=30\text{th May}$, $D_4=15\text{th June}$, $D_5=30\text{th June}$ and $D_6=15\text{th July 1953}$.

Sub-plot treatments :

3 dates of harvest : $S_1=25\text{th Oct.}$, $S_2=10\text{th Nov.}$ and $S_3=25\text{th Nov. 1953}$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main-plot : 1/80.6 ac. and Sub-plot : 1/241.8th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. (ii) Nil. (iii) Yield of sweet potato. (iv) (a) No. (b) Nil. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 6063 lb./ac.
 (ii) (a) 2694.7 lb./ac.
 (b) 2440.5 lb./ac.
 (iii) S effect is highly significant, D effect is significant while their interaction is not significant.
 (iv) Ay. yield of tubers in lb./ac.

	S_1	S_2	S_3	Mean
D_1	13679	9973	14425	12692
D_2	7959	8183	10881	9008
D_3	5036	3668	5223	4642
D_4	3469	3134	5409	4004
D_5	3605	2301	3420	3109
D_6	2711	2761	3295	2922
Mean	6077	5003	7109	6063

S.E. of difference of two

1. D marginal means = 1099.9 lb./ac.
 2. S marginal means = 704.4 lb./ac.
 3. S means at a level of D = 1725.7 lb./ac.
 4. D means at a level of S = 1787.6 lb./ac.

Crop :- Sweet Potato.

Ref :- Pb. 52(149).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'T'.

Object :- To find the irrigational requirements of Sweet Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sarson*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 30 and 31.5.1952. (iv) (a) 3 *desi* plough and 3 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 3 hoeings. (ix) 26.27^r. (x) 22 and 23.11.1952.

2. TREATMENTS :

1. Irrigation after one week.
2. Irrigation after two weeks.
3. Irrigation after three weeks.
4. Irrigation after four weeks.

Three basal irrigations were given to all plots to get plants established.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12' x 30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Sweet potato yield. (iv) (a) Nil. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 5126 lb./ac.

(ii) 611.2 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of sweet potato in lb./ac

Treatment	Av. yield
1.	5569
2.	5196
3.	4885
4.	4854
S.E./mean	= 305.6 lb./ac.

Crop :- Colocasia.

Ref :- Pb. 50(61).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To find the manurial requirements of Colocasia.

1. BASAL CONDITIONS :

(i)-(a) Nil. (b) Potato. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.2.1950. (iv) (a) 4 *desi* ploughings, 2 *sohaga* and 2 ridges. (b) and (c) N.A. (d) Plant to plant 1'. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 49.71^r. (x) 5 and 6.10.1950.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
2. A/S at 100 lb./ac. of N.
3. A/S at 50 lb./ac. of N + Super at 62½ lb./ac. of P₂O₅.
4. A/S at 100 lb./ac. of N + Super at 125 lb./ac. of P₂O₅.
5. Control.

Time and method of application N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30' x 7'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Lime sulphur sprayed against mite on 26.5.1952 (iii) Tuber yield. (iv) (a) 1950-51. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 27249 lb./ac.
 (ii) 1631.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
1.	26227
2.	28410
3.	28264
4.	28970
5.	24375
S.E./mean	= 815.5 lb./ac.

Crop :- Colocasia.

Site :- Jullundur Agri Stn., Jullundur.

Ref :- Pb. 53(113).

Type :- 'M'.

Object :- To find the manurial requirements of Colocasia.

1. BASAL CONDITION :

- (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 26.6.1951. (iv) (a) 4 *desi* ploughing and 2 *sohaga*. (b) to (e) N.A. (v) 20 ton/ac. of F.Y.M. Date N.A. (vi) Local. (vii) Irrigated. (viii) 9 hoeings. (ix) 17.40^o (x) 26.9.1951.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
2. A/S at 100 lb./ac. of N.
3. A/S at 50 lb./ac. of N.+Super at 62½ lb./ac. of P₂O₅.
4. A/S at 100 lb./ac. of N+Super at 125 lb./ac. of P₂O₅.
5. Control.

Time and method of application N.A.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30' x 7'-4". (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. (ii) Nil. (iii) Yield of tubers. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5886 lb./ac.
 (ii) 334.6 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
1.	5142
2.	6797
3.	6441
4.	7255
5.	3793
S.E./mean	= 167.3 lb./ac.

Crop :- Colocasia.

Ref :- Pb. 51(115).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of hoeings and intercropping on the yield of Colocasia.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sweet Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 23.2.1951. (iv) (a) 4 *desi* ploughing and 2 *sohaga*. (b) to (e) N.A. (v) 10 ton/ac. of F.Y.M. Super at 62½ lb./ac. of P₅O₅. A/S at 50 lb./ac. of N. (vi) Local. (vii) Irrigated. (viii) 7 hoeings for treatments 1 and 3 and 5 hoeings for treatment 2. (ix) 17.40°. (x) 21.9.1951.

2. TREATMENTS :

1. Hoeing regularly (2 extra hoeings in May and June).
2. No hoeing in May and June.
3. Intercropping Colocasia with *Karaila* (2 extra hoeings in May and June).

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×8-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tubers. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 6519 lb./ac.
- (ii) 675.4 lb./ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
1.	8289
2.	5892
3.	5377
S.E./mean	=337.7 lb./ac.

Crop :- Colocasia.

Ref :- Pb. 50(60).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of spacing on the yield of Colocasia.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 23 and 24.2.1950. (iv) (a) 4 *desi* plough and 2 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 49.71°. (x) 7 to 9.10.1950.

2. TREATMENTS :

All combinations of (1)×(2)

- (1) 3 spacings between ridges : D₁=1½', D₂=2' and D₃=3'.
- (2) 3 spacings between plants : S₁=6", S₂=9" and S₃=12".

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×7'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Sprayed with lime sulphur against mite on 9th and 10th June, 1950. (iii) Yield of tubers. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 20655 lb./ac.
- (ii) 1773.2 lb./ac.
- (iii) Spacing between ridges effect is highly significant while spacing between plants effect and interaction is not significant.

(iv) Av. yield of colocasia in lb /ac.

	S ₁	S ₂	S ₃	Mean
D ₁	22606	19863	22129	21533
D ₂	22001	22078	20334	21471
D ₃	20264	19398	17221	18961
Mean	21624	20446	19895	20655

S.E. of any marginal mean = 511.9 lb./ac.
S.E. of body of table = 886.6 lb./ac.

Crop :- Colocasia.

Ref :- Pb. 51(144).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of spacing on the yield of Colocasia.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 23 to 24.2.1951.
(iv) (a) 4 *desi* ploughing and 2 *sohaga*. (b) to (e) N.A. (v) 20 ton/ac. of F.Y.M. A/S at 40 lb./ac. of N. Dates of application N.A. (vi) Local. (vii) Irrigated. (viii) 5 hoeings. (ix) 17.40". (x) 18 to 19.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of row spacings : S₁=1½', S₂=2' and S₃=2½'.
(2) 3 levels of plant spacings : D₁=6", D₂=9" and D₃=12".

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×7'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1950-1951. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 5086 lb /ac.
(ii) 392.7 lb./ac.
(iii) Spacing between rows effect and interaction are highly significant.
(iv) Av. yield of colocasia in lb./ac.

	D ₁	D ₂	D ₃	Mean
S ₁	5130	5270	5970	5457
S ₂	5397	5893	5021	5437
S ₃	4735	4493	3869	4366
Mean	5087	5219	4953	5086

S.E. of any marginal mean = 113.4 lb./ac.
S.E. of body of table = 196.3 lb./ac.

Crop :-Colocasia.

Ref :-Pb. 50(62).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'C'.

Object :—To find the optimum date of sowing of Colocasia.

1. BASAL CONDITIONS :

(i) (a) Nil (b) Potato. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 *desi* ploughings and 2 *sohaga*. (b) and (c) N.A. (d) 2'×1'. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 49.71". (x) 3 to 4.10.1950.

2. TREATMENTS :

4 dates of sowing : $D_1=20.2.1950$, $D_2=7.3.1950$, $D_3=26.3.1950$ and $D_4=6.4.1950$.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×7'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination fair. (ii) Sprayed with lime sulphur against mite on 25.5.1950. (iii) Yield of tuber. (iv) (a) 1950—1951. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 23936 lb./ac.

(ii) 1073.7 lb./ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
D_1	29588
D_2	26698
D_3	23815
D_4	15643
S.E./mean	=536.8 lb./ac.

Crop :-Colocasia.

Ref :-Pb. 51(111).

Site :-Jullundur Agri. Stn., Jullundur.

Type :-'C'.

Object :—To find the optimum date of sowing for Colocasia.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) 4 *desi* ploughing and 2 *sohaga*. (b) to (e) N.A. (v) F.Y.M. 20 ton./ac. A/S at 40 lb./ac. of N. Dates N.A. (vi) Local. (vii) Irrigated. (viii) 7 hoeings. (ix) 17.40". (x) 17.10.1951.

2. TREATMENTS :

4 dates of sowing : $D_1=20.2.1951$, $D_2=7.3.1951$, $D_3=22.3.1951$ and $D_4=6.4.1951$.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30'×7'-4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 5122 lb./ac.

(ii) 405.4 lb./ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
D_1	6097
D_2	5448
D_3	5123
D_4	3819
S.E./mean	=202.7 lb./ac.

Crop :- Sugarcane.

Ref :- Pb. 48 (35).

Site :- Distt. and Demon. Farm, Ambala.

Type :- 'M'.

Object :—To study the effect of different sources of N on the yield of Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Guara*. (c) Nil. (ii) (a) Hard clay loam. (b) N.A. (iii) 14.2.1948. (iv) (a) and (b) N.A. (c) 40,000 setts./ac. (d) and (e) N.A. (v) *Guara* ploughed in. Dates N.A. (vi) CO-312 (medium). (vii) Irrigated. (viii) 2 hoeings and one weeding. (ix) 21.59°. (x) 19 to 22.3.1949.

2. TREATMENTS :

1. Control.
2. F.Y.M. at 50 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. Ammo. Phos. at 50 lb./ac. of N.
5. F.Y.M. at 100 lb./ac. of N.
6. A/S at 100 lb./ac. of N.
7. Ammo. Phos. at 100 lb./ac. of N.
8. Ammo. Phos. at 50 lb./ac. of N+F.Y.M. at 50 lb./ac. of N.
9. A/S 50 lb./ac. of N+F.Y.M. at 50 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 88'×11'. (b) 88'×11'. (v) No. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) No. (iii) Yield of sugarcane and *gur*. (iv) (a) 1946 to 1948. (b) No. (c)—. (v) (a) Karnal. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 13.39 ton/ac.
 (ii) 2.92 ton/ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	12.97
2.	15.67
3.	9.76
4.	10.72
5.	14.76
6.	15.26
7.	13.08
8.	14.93
9.	13.33
S.E /mean	= 1.46 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49 (71).

Site :- Distt. and Demon. Farm, Ambala.

Type :- 'M'.

Object :—To study the effect of different sources of N on the yield of Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clayey. (b) N.A. (iii) 13.3.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 30.70°. (x) 4.1.1950 to 6.3.1950.

2. TREATMENTS :

1. Control.
2. Ammo. Phos. at 50 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. *Mohua* cake at 50 lb./ac. of N.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 34.43 ton/ac.
 (ii) 4.07 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	33.32
2.	39.21
3.	34.99
4.	30.20
S.E./mean	= 2.04 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49(70).

Site :- Distt. and Demon. Farm, Ambala.

Type :- 'M'.

Object :- To study the effect of different sources of N on yield of sugarcane with and without trash.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard-clay. (b) N.A. (iii) 10.3.1949. (iv) (a) N.A. (b) N.A. (c) 1000 setts/plot. (d) N.A. (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 30.70". (x) 2.3.1950 to 9.4.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 applications of N : N_0 = Control, N_1 = 75 lb./ac. of N as Ammo. Phos. and N_2 = 75 lb./ac. of N as A/S.

(2) 2 levels of trash : T_0 = No trashing and T_1 = Trashing.
 Manures applied on 28.7.1949.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 14' × 78'. (b) 14' × 78'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Sugarcane and *gur* yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 32.65 ton/ac.
 (ii) 4.31 ton/ac.
 (iii) Only trashing effect is highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

	N_0	N_1	N_2	Mean
T_0	30.09	28.18	26.30	28.19
T_1	38.20	36.69	36.40	37.10
Mean	34.15	32.44	31.35	32.65

S.E. of marginal mean of N = 1.76 ton/ac.
 S.E. of marginal mean of T = 1.44 ton/ac.
 S.E. of body of table = 2.49 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50(80).

Site :- Distt. and Demon. Farm, Ambala.

Type :- 'M'.

Object :- To study the effect of N on yield of Sugarcane with and without trash.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 22.2.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 34.69". (x) 12.3.1951, 3.4.1951 and 6.4.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 5 applications of N : N_0 =Control, N_1 =50 lb./ac. of N as Ammo. Phos., N_2 =75 lb./ac. of N as Ammo. Phos., N_3 =50 lb./ac. of N as A/S and N_4 =75 lb./ac. of N as A/S.(2) 2 levels of trash : T_0 =No trashing and T_1 =trashing.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 14'×78'. (b) 14'×78'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 9.70 ton/ac.

(ii) 3.04 ton/ac.

(iii) Effect of trash is highly significant and effect of manures is also significant Interaction N×T is not significant.

(iv) Av. yield of sugarcane in ton/ac.

	T ₁	T ₂	Mean
N ₀	5.17	11.15	8.16
N ₁	5.25	12.08	8.67
N ₂	6.41	13.76	10.09
N ₃	7.52	12.54	10.03
N ₄	8.62	14.52	11.57
Mean	6.59	12.81	9.70

S.E. of marginal means of T

=0.78 ton/ac.

S.E. of marginal means of N

=1.23 ton/ac.

S.E. of body of table

=1.73 ton/ac.

Crop :- Sugarcane.

Ref. :- Pb. 48 (4).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :- To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 28.3.1948. (iv) (a) Ploughing once by *raja*, 4 times by *desi* plough and 5 times levelling by *sohaga*. (b) N.A. (c) 40,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) N.A. (viii) 1 hoeing. (ix) 27.27". (x) 24.12.1948.

2. TREATMENTS :

1. Control.

2. A/S at 75 lb./ac. of N.

3. A/S at 150 lb./ac. of N.

4. Ammo. Phos. at 75 lb./ac. of N.

5. Ammo. Phot at 150 lb./ac. of N.

6. Super at 100 lb./ac. of P₂O₅.7. Super at 200 lb./ac. of P₂O₅.

A/S, Ammo. Phos. and Super applied in three equal doses on 26.4.1948, 16.7.1948 and 7.8.1948.

3. DESIGN ;

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 66'×11'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good, condition deteriorated due to failure of rains. (ii) N.A. (iii) Yield of sugarcane and gur. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 11.15 ton/ac.

(ii) 2.42 ton/ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	9.25
2.	11.84
3.	12.49
4.	13.10
5.	13.58
6.	9.23
7.	8.59
S.E./mean	= 0.99 ton/ac.

Crop :- Sugarcane.

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 48(8).

Type :- 'M'.

Object :- To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 1st to 2nd April, 1948. (iv) (a) 1 *raja*, 3 *desi*, 1 *panjdanta* and 3 ploughings. (b) [to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 3 hoeings, 1 ridging and one tying up. (ix) 27.27'. (x) 27 to 31.1.1949.

2. TREATMENTS :

1. Control.

2. A/S at 75 lb./ac. of N.

3. A/S at 150 lb./ac. of N.

4. Ammo. Phos. at 75 lb./ac. of N.

5. Ammo. Phos. at 150 lb./ac. of N.

6. Super at 100 lb./ac. of P₂O₅.

7. Super at 200 lb./ac. of P₂O₅.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 21'×72'. (b) 17'×64'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Growth and germination satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane and gur. (iv) (a) No. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 18.11 ton/ac.

(ii) 2.23 ton/ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	15.12
2.	19.06
3.	19.69
4.	20.76
5.	20.29
6.	15.51
7.	16.31
S.E./mean	= 0.91 ton/ac.

Crop :- Sugarcane.
Site :- Govt. Agri. Stn. Gurdaspur.

Ref :- Pb. 48(10).
Type :- 'M'.

Object :- To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 31.3.1948. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 2' row to row. (d) 40000 setts/ac. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.27". (x) 22 to 25.12.1948.

2. TREATMENTS :

1. Control.
 2. A/S at 75 lb./ac. of N.
 3. A/S at 150 lb./ac. of N.
 4. Ammo. Phos. at 75 lb./ac. of N.
 5. Ammo. Phos. at 150 lb./ac. of N.
 6. Super at 100 lb./ac. of P₂O₅.
 7. Super at 200 lb./ac. of P₂O₅.
- A/S, Ammo. Phos. and Super applied in two equal doses on 28.4.1948. and 17.7.1948.

DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 77' × 14'. (b) 72.5' × 10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory ; condition fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 13.55 ton/ac.
(ii) 2.56 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	10.55
2.	15.18
3.	13.80
4.	14.10
5.	16.68
6.	11.17
7.	13.39
S.E./mean	= 1.04 ton/ac.

Crop :- Sugarcane.
Site :- Sugarcane Sub-Stn., Gurdaspur.

Ref :- Pb. 49(57).
Type :- 'M'.

Object :- To study the effect of different manures on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy (b) N.A. (iii) 18.3.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78". (x) 5 to 18.4.1950.

2. TREATMENTS :

1. Control.
 2. 10 C.L./ac. of F.Y.M.
 3. *Mohua* cake at 12.5 md./ac.
 4. A/S at 3 md./ac.
 5. Ammo. Phos. at 4 md./ac.
 6. 5 C.L./ac. of F.Y.M + A/S at 1.5 md./ac.
 7. 5 C.L./ac. of F.Y.M. + Ammo. Phos at 2 md./ac.
 8. *Mohua* cake at 6.25 md./ac. + A/S at 1.5 md./ac.
 9. *Mohua* cake at 6.25 md./ac + Ammo. Phos. at 2 md./ac.
- F.Y.M. and *Mohua* cake applied in February and A/S and Ammo. Phos. applied in middle of July.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 13'×72'. (b) 13×69'-10". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 33.16 ton/ac.
 (ii) 3.399 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	34.84
2.	33.08
3.	34.31
4.	33.53
5.	34.76
6.	32.94
7.	30.17
8.	32.41
9.	32.41
S.E./mean	= 1.70 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49(56).

Site :- Sugarcane Sub-Stn.,Gurdaspur.

Type :- 'M'.

Object :—To study the effect of different manures on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.3.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Unirrigated. (viii) N.A. (ix) 27.78". (x) 15 to 20.12.1949.

2. TREATMENTS :

1. Control.
 2. 10 C.L./ac. of F.Y.M.
 3. *Mohua* cake at 12.5 md./ac.
 4. A/S at 3 md./ac.
 5. Ammo. Phos. at 4 md./ac.
 6. 5 C.L./ac. of F.Y.M.+A/S at 1.5 md./ac.
 7. 5 C.L./ac. of F.Y.M.+Ammo. Phos. at 2 md./ac.
 8. *Mohua* cake at 6.25 md./ac.+A/S at 1.5 md./ac.
 9. *Mohua* cake at 6.25 md./ac.+Ammo. Phos. at 2 md./ac.
- F.Y.M. and *Mohua* cake applied in February and A/S and Ammo. Phos. applied in middle of July.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/48 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 18.05 ton/ac.
 (ii) 2.64 ton/ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	19.30
2.	17.80
3.	20.21
4.	14.16
5.	18.85
6.	16.51
7.	18.93
8.	18.81
9.	17.90
S.E./mean	=1.32 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(110).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of Super on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 23.4.1951. (iv) (a) to (e) N.A. (v) 7 C.L./ac. of F.Y.M. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 25.67". (x) 11.5.1952.

2. TREATMENTS :

P₀=No P₂O₅ (control).P₁=Super at 100 lb./ac. of P₂O₅.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) — (vi) and (vii) Nil.

5. RESULTS :

(i) 23.88 ton/ac.

(ii) 1.154 ton/ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of sugarcane in ton./ac.

Treatment	Av. yield
P ₀	23.92
P ₁	23.83
S.E./mean	= 0.471 ton./ac.

Crop :- Sugarcane.

Ref :- Pb. 50 (58).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20.3.1950. (iv) (a) 4 ploughings and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 1 earthing up, 1 tying and 2 hoeings. (ix) 55.35". (x) 5.2.1951 to 17.3.1951.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : $N_0=0$, $N_1=100$ and $N_2=200$ lb./ac.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=100$ and $P_2=200$ lb./ac.
 (3) 3 levels of K_2O : $K_0=0$, $K_1=100$ and $K_2=200$ lb./ac.

N as A/S applied on 23.5.1950, P_2O_5 as Super on 19.3.1950 and K_2O as Pot. Sul. on 19.3.1950.

3. DESIGN :

- (i) 3rd Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 71'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination and condition good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953
 (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 28.61 ton/ac.
 (ii) 2.755 ton/ac.
 (iii) Effect of N is highly significant while all others are not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	24.98	25.73	24.73	25.15	23.96	25.39	26.69
N_1	29.88	30.47	29.66	30.00	30.19	29.03	30.79
N_2	31.65	30.46	29.97	30.69	30.78	30.87	30.52
Mean	28.84	28.89	28.12	28.61	28.31	28.40	29.13
K_0	28.89	28.35	27.69	28.31			
K_1	28.25	28.37	28.58	28.40			
K_2	29.37	29.94	28.09	29.13			

S.E. of any marginal mean = 0.459 ton/ac.
 S.E. of body of table = 0.795 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Sub-Stn., Gurdaspur.

Ref :- Pb. 51 (108).

Type :- 'M'.

Object :- To study the effect of N, P_2O_5 and K_2O on yield of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.3.1951. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 40,000 setts/ac. (d) and (e) N.A. (v) 44 C.L./ac. of F.Y.M. (vi) CO.312 (medium)
 (vii) Irrigated. (viii) N.A. (ix) 25.67". (x) 18 and 19.3.1952.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : $N_0=0$, $N_1=100$ and $N_2=200$ lb./ac.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=100$ and $P_2=200$ lb./ac.
 (3) 3 levels of K_2O : $K_0=0$, $K_1=100$ and $K_2=200$ lb./ac.

N as A/S applied on 21.5.1951, P_2O_5 as Super on 5.3.1951 and K_2O as Pot. Sul. on 3.3.1951.

3. DESIGN :

- (i) 3rd Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 26.50 ton/ac.
 (ii) 3.426 ton/ac.
 (iii) N effect is highly significant while all other effects are not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	18.43	20.65	19.01	19.36	21.88	17.60	18.61
N ₁	28.82	29.58	30.66	29.69	29.80	29.34	29.93
N ₂	29.96	31.01	30.34	30.44	29.70	30.58	31.03
Mean	25.74	27.08	26.67	26.50	27.13	25.84	26.52
K ₀	26.55	28.36	26.47	27.13			
K ₁	25.56	25.84	26.11	25.84			
K ₂	25.10	27.03	27.74	26.52			

S.E. of any marginal mean = 0.571 ton/ac.

S.E. of body of table = 0.989 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Sub-Stn., Gurdaspur.

Ref :- Pb. 52(50).

Type :- 'M'.

Object :—To study the effect of N, P₂O₅ and K₂O on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize for fodder. (c) Nil. (ii) Loamy. (b) N.A. (iii) 14.3.1952. (iv) (a) 3 ploughings and 3 *sohaga*. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (late). (vii) Irrigated. (viii) 5 hoeings, 1 ridging and 2 tying up. (ix) 28.50". (x) 18.1.1953 to 1.3.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N: N₀=0, N₁=100 and N₂=200 lb./ac.

(2) 3 levels of P₂O₅: P₀=0, P₁=100 and P₂=200 lb./ac.

(3) 3 levels of K₂O: K₀=0, K₁=100 and K₂=200 lb./ac.

P₂O₅ as Super applied in furrows 4" deep, K₂O as Pot. Sul. by broadcasting a day before planting and N as A/S in two equal doses in May and June 1952.

3. DESIGN :

(i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 72'×14'. (b) 62'×12.75'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 31.34 ton/ac.
 (ii) 3.18 ton/ac.
 (iii) Only N effect is highly significant while all others are not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	25.46	26.49	24.36	25.44	25.68	24.71	25.93
N ₁	34.13	33.79	33.52	33.81	33.12	34.36	33.96
N ₂	35.73	33.19	35.41	34.77	33.35	34.56	36.41
Mean	31.77	31.15	31.10	31.34	30.71	31.21	32.10
K ₀	31.50	30.01	30.63	30.71			
K ₁	31.15	31.55	30.92	31.21			
K ₂	32.67	31.90	31.74	32.10			

S.E. of any marginal mean = 0.53 ton/ac.
 S.E. of body of table = 0.918 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(84).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O on yield of Sugarcane.

1. BASAL CONDITIONS:

- (i) (a) Wheat—Chari—Sugarcane. (b) Chari. (ii) Loam. (b) N.A. (iii) 23.3.1953 and 24.3.1953. (iv) (a) 10 *desi hal* and 13 *sohaga*. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO. 312 (late). (vii) Irrigated. (viii) 4 hoeings, 1 ridging and 1 tying up. (ix) 34.46%. (x) 26.12.1933 to 6.1.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N: N₀=0, N₁=100 and N₂=200 lb./ac.

(2) 3 levels of P₂O₅: P₀=0, P₁=100 and P₂=200 lb./ac.

(3) 3 levels of K₂O: K₀=0, K₁=100 and K₂=200 lb./ac.

N as A/S applied on 12.5.1953 and 28.6.1953, P₂O₅ as Super and K₂O as Pot. Sul. on 23.3.1953.

3. DESIGN :

- (i) 3³ partially confounded. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 14' × 72'. (b) 14' × 62.75'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) Jullundur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 32.35 ton/ac.
 (ii) 2.458 ton/ac.
 (iii) Non of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	26.12	27.35	27.24	26.90	26.85	26.92	26.94
N ₁	35.01	33.95	35.04	34.67	34.84	33.90	35.27
N ₂	34.25	36.49	35.66	35.47	35.54	35.41	35.45
Mean	31.79	32.60	32.65	32.35	32.41	32.08	32.55
K ₀	31.70	33.36	32.17	32.41			
K ₁	31.60	31.88	32.76	32.08			
K ₂	32.08	32.56	33.02	32.55			

S.E. of any marginal mean = 0.41 ton/ac.
 S.E. of body of table = 0.71 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(85).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'M'.

Object :- To study the effect of different doses of N in combination with P₂O₅ on irrigated Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Senji-Sugarcane. (b) Senji. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 3 4.1953. (iv) (a) 5 ploughings and 9 *sohaga*. (b) N.A. (c) 35000 setts/ac. (d) 2'×2'. (e) N.A. (v) Nil. (vi) CO.312 (late). (vii) Irrigated. (viii) 1 bar harrow, 3 hoeings and one earthing up. (ix) 34.46". (x) 20.12.1953.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 4 applications of N : N₀=0 lb./ac., N₁=140 lb./ac. of N as G.N.C, N₂=140 lb./ac. of N as A/S and N₃=140 lb./ac. of N as F.Y.M.

(2) 2 levels of P₂O₅ : P₀=0 and P₁=100 lb./ac. of P₂O₅ as Super.

G.N.C. and A/S applied after planting on 12.5.1953 and F.Y.M. before sowing on 23.2.1953.

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 14'×72'. (b) 14'×62'-3". (v) 3' on either side. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Tube well went out of order and so adequate irrigation could not be given during hot weather. But due to good rain during monsoon period the crop condition came almost to normal growth. In 1952 experiment with two varieties was conducted. See Pb. 52(52) under category 'VM'.

5. RESULTS :

(i) 27.56 ton/ac.
 (ii) 2.01 ton/ac.
 (iii) No effect is significant.

(iv) Av. yield of sugarcane in ton/ac.

	N ₀	N ₁	N ₂	N ₃	Mean
P ₀	26.10	28.10	27.42	27.99	27.40
P ₁	25.91	27.76	29.93	27.25	27.71
Mean	26.00	27.93	28.72	27.62	27.56

S.E. of marginal mean of N =0.71 ton/ac.

S.E. of marginal mean of P₂O₅ =0.58 ton/ac.

S.E. of body of table =1.01 ton/ac.

Crop :- Sugarcane .

Ref :- Pb. 49(75).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :—To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 9.3.1949. (iv) (a) 3 disc harrow, one roller and 3 *desi hal*. (b) to (e) N.A. (v) Nil. (vi) CO. 421 (medium). (vii) Irrigated. (viii) 1 blind hoeing, 2 hoeings, 1 *sohaga* and one roller. (ix) 27.70°. (x) N.A.

2. TREATMENTS :

1. Control.
2. *Mohua* cake at 12.5 md./ac.
3. F.Y.M. at 10 C.L./ac.
4. A/S at 3 md./ac.
5. Ammo. Phos. at 4 md./ac.
6. F.Y.M. at 5 C.L./ac.+A/S at 1.5 md./ac.
7. F.Y.M. at 5 C.L./ac.+Ammo. Phos. at 2 md./ac.
8. *Mohua* cake at 6.25 md./ac.+A/S at 1.5 md./ac.
9. *Mohua* cake at 6.25 md./ac.+Ammo. Phos. at 2 md./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Since *Mohua* cake was not applied for analysis treatments 1 and 2 both were taken as control.

5. RESULTS :

- (i) 3.82 ton/ac.
- (ii) 0.48 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1 and 2.	3.52
3.	3.82
4.	3.84
5.	4.38
6.	3.87
7.	3.84
8.	3.97
9.	3.63

S.E./mean other than control =0.24 ton/ac.

S.E. of control mean =0.17 ton/ac.

Crop :-Sugarcane.
Site :-Govt. Agri. Stn., Hansi.

Ref :-Pb. 50(89).
Type :- 'M'.

Object :—To find out the manurial requirements of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 1.3.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) CO-421 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 ridging and 2 tying up. (ix) 16.67". (x) 15,20.3.1951, 4,9 to 12,16.4.1951.

2. TREATMENTS :

1. Control.
2. *Mohua* cake at 12.5 md./ac.
3. F.Y.M. at 10 ton/ac.
4. A/S at 3 md./ac.
5. Ammo. phos. at 4 md./ac.
6. F.Y.M. at 5 ton/ac.+A/S at 1.5 md./ac.
7. F.Y.M. at 5 ton/ac.+Ammo. Phos. at 2 md./ac.
8. *Mohua* cake at 6.25 md./ac. + A/S at 1.5 md./ac.
9. *Mohua* cake at 6 25 md./ac.+Ammo. Phos. at 2 md./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1949-1950. (b) and (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) *Mohua* cake was not available, hence it was not applied. Treatments 1 and 2 were taken as control for analysis.

5. RESULTS :

- (i) 37.51 ton/ac.
(ii) 4.73 ton/ac.
(iii) Treatments are significantly different.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1. & 2.	32.95
3.	41.51
4.	37.93
5.	40.13
6.	40.41
7.	38.57
8.	34.30
9.	38.85
S.E. of control mean	= 1.44 ton/ac.
S.E./mean other than control	= 2.37 ton/ac.

Crop :- Sugarcane.
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 48(11)
Type :- 'M'.

Object :—To study the effect of A/S on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 25.3.1948. (iv) (a) 1 *raja*, 1 horse hoe, 5 *desi* and 3 *sohaga*. (b) N.A. (c) 75 md./ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 26.44". (x) 10 to 25.2.1949.

2. TREATMENTS :

1. Control.
 2. A/S at 75 lb./ac. of N.
 3. A/S at 100 lb./ac. of N.
 4. A/S at 125 lb./ac. of N.
 5. A/S as 150 lb./ac. of N.
- A/S applied on 3.7.1949.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 110'×12'. (b) 90.75'×12'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Severe attack of *Pyrilla* but it was controlled by dusting gammaxene at 56 lb./ac. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) N I.

5. RESULTS :

- (i) 41.69 ton/ac.
 (ii) 1.77 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	40.24
2.	41.29
3.	42.49
4.	42.12
5.	42.30
S.E./mean	= 0.79 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(86).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of compost along with artificial manures on Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.3.1953. (iv) (a) 1 *raja* plough, 3 *desi* plough and 8 *sohaga*. (b) N.A. (c) 60,000 setts./ac. (d) 2' row to row. (e) N.A. (ix) (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) One hoeing, 2 weedings, 1 ridging and tying up. 25.73". (x) 26.12.1953 to 29.3.1954.

2. TREATMENTS :

All possible combinations of (1) and (2)

1. 3 levels of compost: C_0 =Control, C_1 =8 and C_2 =16 ton/ac. Compost applied on 19.3.1953 by broadcast.
2. 4 doses of inorganic manures: M_0 =Control, M_1 =50 lb./ac. of N as A/S, M_2 =100 lb./ac. of N as A/S and M_3 =40 lb./ac. of P_2O_5 as Super.
 A/S and Super applied on 8.5.1953 by broadcast.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 52'×14'. (b) 47.14'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination and condition good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 45.81 ton/ac.
 (ii) 3.34 ton/ac.
 (iii) Main effect of compost is significant while other effects are not significant.

(iv) Av. yield of sugarcane in ton/ac.

	C ₀	C ₁	C ₂	Mean
M ₀	44.55	43.85	47.88	45.43
M ₁	43.88	44.41	48.75	45.68
M ₂	44.55	46.47	48.94	46.65
M ₃	44.10	46.97	45.31	45.46
Mean	44.27	45.43	47.72	45.81

S.E. of marginal mean of M = 0.83 ton/ac.
 S.E. of marginal mean of C = 0.96 ton/ac.
 S.E. of body of table = 1.67 ton/ac.

Crop :- Sugarcane (*Kharif*).

Ref :- Pb. 49(19).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different fertilizers on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 29.3.1949. (iv) (a) 6 *desi hal* and 7 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) Tying up and one horse hoe. (ix) 21.07". (x) 2.2.1950 to 25.4.1950.

2. TREATMENTS :

- 100 lb./ac. of N as A/S.
- 100 lb./ac. of N as Ammo. Phos.
- 100 lb./ac. of N as A/S+125 lb./ac. of P₂O₅ as Super.
- 100 lb./ac. of N as F.Y.M.
- 100 lb./ac. of N as *Mohua* Cake.
- Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 50'×16'. (b) 45'-4½"×16'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and condition good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) No. of treatments changed after 1949. Experiment not conducted in 1950.

5. RESULTS :

- (i) 56.06 ton/ac.
 (ii) 8.28 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of Sugarcane in ton/ac.

Treatment	Av. yield
1.	49.16
2.	51.32
3.	49.33
4.	44.63
5.	49.42
6.	50.47
S.E./mean	= 3.38 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(85).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different fertilizers on Sugarcane yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.3.1951. (iv) (a) One *raja*, 15 *desi hal* and 8 *sohaga*. (b) N.A. (c) 54,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 2 hoeings with *Bagoori* and 2 hoeings with horse hoe. (ix) 21.25". (x) 31.1.1952 to 6.2.1952.

2. TREATMENTS :

1. 100 lb./ac. of N as A/S.
2. 100 lb./ac. of N as A/S+125 lb./ac. of P₂O₅ as Super.
3. 100 lb./ac. of N as G.N.C.
4. 100 lb./ac. of N as F.Y.M.
5. Control.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 50'×14'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination good. No lodging. (ii) Attack of borer. (iii) Yield of sugarcane. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 42.67 ton/ac.
 (ii) 3.31 ton/ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	45.70
2.	44.81
3.	45.84
4.	41.61
5.	35.41
S.E./mean	= 1.35 ton/ac.

Crop :- Sugarcane.

Ref :-Pb. 52(61).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different fertilizers on Sugarcane yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 12.3.1952. (iv) (a) One *raja* plough, 6 *desi hal*, 4 *sohaga* and 1 roller. (b) N.A. (c) 60,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) One ridging, one tying up and one earthing up. (ix) 29.82". (x) 13.2.1953 to 3.3.1953.

2. TREATMENTS :

1. 100 lb./ac. of N as A/S.
2. 100 lb./ac. of N as A/S+125 lb./ac. of P₂O₅ as Super.
3. 100 lb./ac. of N as G.N.C.
4. 100 lb./ac. of N as F.Y.M.
5. Control.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 52'×15'. (b) 52'×14'. (v) One foot left on one side. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane and *gur* yield for replications 5 and 6. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 38.98 ton/ac.
 (ii) 2.51 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	39.27
2.	41.12
3.	36.37
4.	39.23
5.	38.89
S.E./mean	= 1.02 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50 (64).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object : -To study the effect of N, P₂O₅ and K₂O on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 50.12°. (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : N₀=0, N₁=100 and N₂=200 lb./ac. as A/S.
 (2) 3 levels of P₂O₅ : P₀=0, P₁=100 and P₂=200 lb./ac. as Super.
 (3) 3 levels of K₂O : K₀=0, K₁=100 and K₂=200 lb./ac. as Pot. Sul.

A/S applied in two equal doses 95 and 115 days after planting. Super applied in furrows at a depth of 4" and Pot. Sul. by broadcasting at the time of planting.

3. DESIGN :

(i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40. ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Experiment modified after 1950.

5. RESULTS :

- (i) 27.26 ton/ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	26.47	25.28	25.42	25.72	26.86	23.06	27.24
N ₁	27.82	29.19	27.40	28.14	28.03	29.12	27.26
N ₂	27.08	26.64	30.05	27.92	27.40	28.02	28.35
Mean	27.12	27.04	27.62	27.26	27.43	26.73	27.62
K ₀	26.95	28.46	26.88				
K ₁	25.75	26.34	28.11				
K ₂	28.67	26.31	27.88				

S.E. for any marginal mean N.A.
 S.E. of body of tables N.A.

Crop :- Sugarcane.

Ref :- Pb. 51 (39).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.4.1951.
 (iv) (a) to (e) N.A. (v) Nil. (vi) CO.L.-9 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 19.12.1951.
 to 24.12.1951.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N : N₀=0, N₁=100 and N₂=200 lb./ac. as A/S.(2) 3 levels of P₂O₅ : P₀=0, P₁=100 and P₂=200 lb./ac. as Super.(3) 3 levels of K₂O : K₀=0, K₁=100 and K₂=200 lb./ac. as Pot. Sul.

Half A/S applied on 26.6.51, half on 6.7.51, Pot. Sul. applied on 19,20.4.51 and Super on 21,22.4.51.

3. DESIGN :

(i) 3³ Fact. confd. Confounding W, X, Y and Z components of NPK. (ii) (a) 9 plots per block and 3 blocks per replication. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×90'-9". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil.
 (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 10.06 ton/ac.

(ii) 1.44 ton/ac.

(iii) Main effect of N is highly significant while others are not significant.

(iv) Av. yield of sugarcane in ton./ac:

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	8.36	8.97	8.46	8.60	8.45	8.67	8.66
N ₁	10.84	10.82	9.86	10.51	10.47	10.40	10.65
N ₂	10.75	10.90	11.56	11.07	11.05	11.43	10.73
Mean	9.98	10.23	9.96	10.06	9.99	10.17	10.01
K ₀	9.97	9.89	10.11	9.99			
K ₁	10.27	10.34	9.89	10.17			
K ₂	9.71	10.45	9.88	10.01			

S.E. of marginal mean of N, P or K

=0.24 ton/ac.

S.E. of body of tables

=0.42 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(117).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Kharif* fodder—Fallow—Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.3.1952. (iv) (a) 4 *desi hal*, 4 *sohaga* and 2 tractor ploughings. (b) to (c) N.A. (v) 70 lb./ac. of N as F.Y.M. on 18.3.1952. (vi) CO.L.-9 (medium). (vii) Irrigated. (viii) 6 hoeings and 1 earthing up. (ix) 36.61%. (x) 2.1.1953 to 4.9.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : N₀=0, N₁=100 and N₂=200 lb./ac. as A/S.
 (2) 3 levels of P₂O₅ : P₀=0, P₁=100 and P₂=200 lb./ac. as Super.
 (3) 3 levels of K₂O : K₀=0, K₁=100 and K₂=200 lb./ac. as Pot. Sul.

3. DESIGN :

(i) 3³ Fact. confd. partially confounding W, X, Y and Z components of NPK. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 12'×105'. (b) 12'×90'-9". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 13.13 ton/ac.
 (ii) 2.76 ton/ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	12.36	11.28	11.17	11.60	10.82	11.13	12.86
N	12.87	13.28	13.69	13.28	13.55	13.33	12.95
N ₂	14.30	14.42	14.83	14.52	15.01	14.00	14.55
Mean	13.18	12.99	13.23	13.13	13.13	12.82	13.45
K ₀	13.10	12.98	13.30	13.13			
K ₁	12.26	13.14	13.07	12.82			
K ₂	14.17	12.86	13.33	13.45			

S.E. of marginal mean of N, P or K = 0.46 ton/ac.
 S.E. of body of table = 0.80 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(135).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Kharif* fodder—Fallow—Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.3.1953. (iv) (a) 1 *desi hal*, 6 *sohaga*, 1 *hindustan* plough and 5 tractor ploughings. (b) to (c) N.A. (v) 100 lb./ac. of N as F.Y.M. (vi) CO.L.-9 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8%. (x) 13.12.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : $N_0=0$, $N_1=100$ and $N_2=200$ lb./ac. as A/S.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=100$ and $P_2=200$ lb./ac. as Super.
 (3) 3 levels of K_2O : $K_0=0$, $K_1=100$ and $K_2=200$ lb./ac. as Pot. Sul.

Half A/S applied on 23.5.53 and the other half on 29.6. 1953. Pot. Sul. applied on 18.19.3.53. Super applied at 19.3.53.

3. DESIGN :

- (i) 3^3 Fact. confounding W, X, Y and Z components of NPK. (ii) (a) 9 plots/block ; 3 blocks/replications. (b) N.A. (iii) 4. (iv) (a) $12' \times 105'$. (b) $12' \times 90' - 9''$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 20.61 ton/ac.
 (ii) 1.74 ton/ac.
 (iii) N effect highly significant, NP significant, PK highly significant, while others are not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	19.10	16.89	19.75	18.58	18.07	18.44	19.24
N_1	20.48	21.37	21.56	21.14	21.18	21.21	21.03
N_2	23.15	21.63	21.52	22.10	22.85	22.00	21.45
Mean	20.91	19.96	20.94	20.61	20.70	20.55	20.57
K_0	20.95	20.66	20.48	20.70			
K_1	21.86	18.96	20.83	20.55			
K_2	19.93	20.27	21.52	20.57			

S.E. of marginal means of N,P or K = 0.29 ton/ac.
 S.E. of body of tables = 0.50 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Ref :- Pb. 52(110).

Type :- 'M'.

Object :- To study the effect of N, P_2O_5 and K_2O on Sugarcane yield.

1. BASAL CONDITIONS :

- (i) (a) Wheat—*Kharif* fodder—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 1.3.1952. (iv) (a) One tractor, 3 *desi hal*, 1 *hindustan* plough and 5 *sohaga*. (b) to (e) N.A. (v) No. (vi) CO.L.-9 (medium). (vii) Irrigated. (viii) 6 hoeings and one earthing up. (ix) 36.61". (x) 11.11.1952 to 19.3.1953.

2. TREATMENTS:

All combinations of (1), (2) and (3)

- (1) 3 levels of N : $N_0=0$, $N_1=100$ and $N_2=200$ lb./ac. as A/S.
 (2) 3 levels of P_2O_5 : $P_0=0$, $P_1=100$ and $P_2=200$ lb./ac. as Super.
 (3) 3 levels of K_2O : $K_0=0$, $K_1=100$ and $K_2=200$ lb./ac. as Pot. Sul.

Super applied on 1.3.52, Pot. Sul. applied on 1.3.52. A/S applied in two equal doses, one on 29.30.5.52 and the other on 26.30.6.52.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) and (b) 121'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Pyrrilla attack ; sparying by Hexaclame on 11.9.1952. (iii) Yield of sugarcane. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.26 ton/ac.
 (ii) 1.79 ton/ac.
 (iii) N effect is highly significant, P effect is significant while all other effects are not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	13.69	16.49	13.72	14.63	15.44	14.55	13.91
N ₁	17.97	18.54	18.05	18.19	18.70	18.18	17.68
N ₂	18.86	18.77	19.28	18.97	18.61	19.30	19.01
Mean	16.84	17.93	17.02	17.26	17.58	17.34	16.87
K ₀	16.45	19.13	17.17	17.58			
K ₁	17.32	17.40	17.31	17.34			
K ₂	16.76	17.27	16.58	16.87			

S.E. of any marginal mean = 0.30 ton/ac.
 S.E. of body of table = 0.52 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(127).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Kharif* fodder—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 9.3.1953. (iv) (a) 4 *desi hal*, 2 *sohaga* and 2 tractor ploughings. (b) N.A. (c) 30,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.L.-9 (medium). (vii) Irrigated. (viii) 6 hoeings and one earthing up. (ix) 32.8". (x) 30.12.1953 to 2.1.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : N₀=0, N₁=100 and N₂=200 lb./ac. as A/S.
 (2) 3 levels of P₂O₅ : P₀=0, P₁=100 and P₂=200 lb./ac. as Super.
 (3) 3 levels of K₂O : K₀=0, K₁=100 and K₂=200 lb./ac. as Pot. Sul.

One half A/S applied a 23.5.1953 and the other half on 13.7.1953. Supper applied an 7.3.1953 and Pot. Sul. on 9.3.1953.

3. DESIGN :

(i) 3³ fact. confd. confounding W, X, Y and Z components of NPK. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'×90'×9". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 24.35 ton/ac.
(ii) 2.75 ton/ac.
(iii) Only N effect is highly significant while others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean	K ₀	K ₁	K ₂
N ₀	19.81	21.48	19.75	20.35	19.50	20.88	20.66
N ₁	25.11	25.07	26.38	25.52	26.28	24.81	25.48
N ₂	26.97	26.80	27.79	27.19	27.31	27.12	27.15
Mean	23.96	24.45	24.64	24.35	24.36	24.27	24.43
K ₀	23.87	24.74	24.48	24.36			
K ₁	23.50	24.66	24.65	24.27			
K ₂	24.52	23.96	24.80	24.43			

S.E. of marginal means of N, P and K = 0.46 ton/ac.
S.E. of body of tables = 0.79 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(40).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To test the efficacy of *Mohua* cake on Sugarcane yield.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 26.4.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 2 hoeings, 2 tying and 3 earthing up. (ix) 17.98°. (x) 30.11.1951 to 5.12.1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F₀=Control and F₁=F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments :

All combinations of (1) and (2)+a control.

(1) 3 levels of N : N₁=50, N₂=100 and N₃=125 lb./ac.

(2) 2 sources of N : S₁=*Mohua* cake composted and S₂=*Mohua* cake uncomposted.

F.Y.M. applied on 24.4.1951 and *mohua* cake on 25.4.1951.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 11.19 ton/ac.
(ii) (a) 2.59 ton/ac.
(b) 1.25 ton/ac.
(iii) None of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	N ₁ S ₁	N ₂ S ₁	N ₃ S ₁	N ₁ S ₂	N ₂ S ₂	N ₃ S ₂	Control	Mean
F ₀	10.65	10.02	11.23	10.33	11.56	11.23	9.68	10.67
F ₁	11.63	11.44	11.65	11.13	12.04	12.71	11.32	11.70
Mean	11.14	10.72	11.44	10.73	11.80	11.97	10.50	11.19

S.E. of difference of two

1. main-plot treatment means =0.69 ton/ac.
2. sub-plot treatment means =0.62 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment =0.89 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment =1.07 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(112)

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :-To test the efficacy of *Mohua* cake on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Wheat-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur Cantt. (iii) 10.4.1952. (iv) (a) 3 *desi hal*, 3 tractor, 4 *sohaga* and levelling. (b) N.A. (c) 37000 setts/ac. (d) and (e) N.A. (v) No. (vi) CO.312 (medium). (vii) Irrigated. (viii) 9 hoeings. (ix) 36.61%. (x) 4.12.1952, 8.12.1952 and 29.1.1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M : F₀=No F.Y.M. and F₁=F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments :

All combinations of (1) and (2)+a control.

(1) 3 levels of N : N₁=50, N₂=100 and N₃=150 lb./ac.(2) 2 sources : S₁=*Mohua* cake composted and S₂=*Mohua* cake uncomposted.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) sub-plot : 90'-9"×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.92 ton/ac.
- (ii) (a) 2.80 ton/ac.
- (b) 1.67 ton/ac.
- (iii) Only interaction main×sub is significant.
- (iv) Av. yield of sugarcane in ton/ac.

	N ₁ S ₁	N ₂ S ₁	N ₃ S ₁	N ₁ S ₂	N ₂ S ₂	N ₃ S ₂	Control	Mean
F ₀	17.84	19.99	17.21	18.33	17.40	18.38	17.40	18.08
F ₁	18.23	16.01	18.38	17.48	18.75	17.27	18.20	17.76
Mean	18.04	18.00	17.79	17.90	18.08	17.83	17.80	17.92

S.E. of difference of two

1. main-plot treatment means =0.75 ton/ac.
2. sub-plot treatment means =0.83 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment =1.18 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment. =1.32 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(131).

Site :- Sugarcane Res. Stn. Jullundur Cantt.

Type :- 'M'.

Object :- To test the efficacy of *Mohua* cake on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Wheat-*Kharif* fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 10.4.1953. (iv) (a) 3 *desi hal*, 2 tractor, 6 *sohaga* and one horse hoe. (b) N.A. (c) 35000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8°. (x) 25,26.12 1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0 = \text{NO F.Y.M.}$ and $F_1 = \text{F.Y.M. at 50 lb./ac. of N.}$

Sub-plot treatments :

All combinations of (1) and (2) + a control.

(1) 3 levels of N : $N_1 = 50$, $N_2 = 100$ and $N_3 = 150$ lb./ac.(2) 2 sources : $S_1 = \text{Mohua cake composted}$ and $S_2 = \text{Mohua cake uncomposted}$.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 99.75' x 8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 15.62 ton/ac.

(ii) (a) 4.93 ton/ac.

(b) 4.15 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	N_1S_1	N_2S_1	N_3S_1	N_1S_2	N_2S_2	N_3S_2	Control	Mean
F_0	14.45	15.23	16.28	13.92	15.63	17.70	15.88	15.58
F_1	15.88	15.14	15.50	15.94	15.64	16.24	15.03	15.62
Mean	15.17	15.24	15.89	14.93	15.64	16.97	15.46	15.60

S.E. of difference of two

1. main-plot treatment means

=1.32 ton/ac.

2. sub-plot treatment means

=1.07 ton/ac.

3. sub-plot treatment means at the same level of main-plot treatment =1.52 ton/ac.

4. main-plot treatment means at the same level of sub-plot treatment =1.93 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(111).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To compare the effect of inorganic and organic manures.

1. BASAL CONDITIONS :

(i) (a) Wheat-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 10.3.1952. (iv) (a) 4 *desi hal* and 5 *sohaga*. (b) N.A. (c) 35000 setts/ac. (d) and (e) N.A. (v) No. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 8 hoeings, 1 earthing up and tying. (ix) 36.61°. (x) 3.12.1952, 19.1.1953, 1.2.1953, 5.2.1953, and 21.3.1953.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 3 sources of N : S_1 =G.N.C., S_2 =A/S and S_3 =C/N.

(2) 2 levels of N : N_1 =100 and N_2 =200 lb./ac.

G.N.C. applied on 9.3.1952. Half-dose of A/S and half dose of C/N on 28.5.1952 and remaining halves on 1.7.1952 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 90'×9"×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.54 ton/ac.

(ii) 1.88 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	Control =27.14 ton/ac.			Mean
	S_1	S_2	S_3	
N_1	29.29	29.61	28.75	29.22
N_2	29.92	27.79	27.30	28.34
Mean	29.60	28.70	28.03	28.78

S.E. of marginal means of S =0.66 ton/ac.

S.E. of marginal means of N =0.54 ton/ac.

S.E. of body of table =0.94 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53 (136).

Site :- Sugarcane Res. Stn., Jullundur Cantt..

Type :- 'M'.

Object :—To compare the effect of in organic and inorganic manures.

1. BASAL CONDITIONS :

(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 22.3.1953. (iv) (a) 2 *desi hal*, 6 *sohaga*, 1 *hindustan hal*, 1 *karki*, 1 horse hoe and 5 tractor ploughings. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 4 hoeings, twice earthing up and twice tying up. (ix) 32.8". (x) 14, 15.2.1954.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 3 sources of N : S_1 =G.N.C., S_2 =A/S and S_3 =C/N.

(2) 2 levels of N : N_1 =100 and N_2 =200 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×90.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a)—. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 33.30 ton/ac.

(ii) 2.72 ton/ac.

(iii) Only "control vs. others" effect is highly significant.

(iv) Av. yield of sugarcane in ton/ac.

	Control = 27.28 lb./ac.			
	S ₁	S ₂	S ₃	Mean
N ₁	34.40	33.38	34.42	34.07
N ₂	33.61	35.46	34.57	34.55
Mean	34.01	34.42	34.50	34.31

S.E. of marginal means of S = 0.96 ton/ac.

S.E. of marginal means of N = 0.79 ton/ac.

S.E. of body of table = 1.36 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53 (130).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To compare the effect of inorganic and organic manures.

1. BASAL CONDITIONS :

(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 25.3.1953. (iv) (a) 3 *desi hal*, 4 *sohaga* and 2 *hindustan* plough. (b) N.A. (c) 35,000 setts/ac. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 6 hoeings. (ix) 32.8". (x) 20.2.1954.

2. TREATMENTS :

- G.N.C. and A/S at 40 lb./ac. of N both at planting.
- G.N.C. and A/S at 40 lb./ac. of N, G.N.C. at planting while A/S applied in May and June.
- G.N.C. 100 lb./ac. of N at planting.
- A/S 100 lb./ac. of N in May and June.
- Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 45'-4½" × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.25 ton/ac.

(ii) 2.37 ton/ac.

(iii) Treatment differences are highly significant.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	28.10
2.	28.27
3.	28.69
4.	29.41
5.	21.78
S.E./mean	= 1.18 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(118).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To find out the best manurial combination for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Kharif* fodder—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur Cantt. (iii) 29.3.1952. (iv) (a) 4 *desi hal*, 5 *sohaga* and 2 tractors. (b) to (e) N.A. (v) As per treatments. (vi) CO-312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 36.61". (x) 13.1.1953 to 16.1.1953.

2. TREATMENTS :

Main-plot treatments :

3 doses of basal dressings : B₀=No basal dressing, B₁=Lime at 50 lb./ac. and B₂=F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments :

5 doses of N : N₀=Control, N₁=A/S at 100 lb./ac. of N, N₂=C/N at 100 lb./ac. of N, N₃=A/S at 200 lb./ac. of N and N₄=C/N at 200 lb./ac. of N.

F.Y.M. applied on 27.3.1952, lime on 27.3.1952. Half of A/S on 25.6.1952 and half applied on 13.7.1952. Half of C/N applied on 26.6.1952 and half on 13.7.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 12.31 ton/ac.
 (ii) (a) 2.24 ton/ac.
 (b) 1.31 ton/ac.
 (iii) Main-plot treatments are significantly different, sub-plot treatments are highly significant, while interaction is not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	Mean
B ₀	9.98	13.38	12.47	15.51	12.57	12.78
B ₁	10.96	12.92	12.32	16.37	14.35	13.38
B ₂	8.54	10.59	10.78	11.87	12.09	10.77
Mean	9.83	12.30	11.86	14.58	13.00	12.31

S.E. of difference of two

1. B marginal means =0.71 ton/ac.
 2. N marginal means =0.54 ton/ac.
 3. N means at the same level of B =0.93 ton/ac.
 4. B means at the same level of N =1.09 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(134).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To find out the best manurial combination for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 13.3.1953. (iv) (a) 4 *desi hal*, 5 *sohaga*, 2 tractors and 3 horse hoe. (b) to (e) N.A. (v) As per treatments. (vi) CO-312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8". (x) 14,15.2.1954.

2. TREATMENTS :**Main-plot treatments :**

3 basal dressings : B_0 =No basal dose, B_1 =A/S at 50 lb./ac. of N and B_2 =F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments :

5 doses of N : N_0 =0, N_1 =A/S at 100 lb./ac. of N, N_2 =A/S at 200 lb./ac. of N, N_3 =C/N at 100 lb./ac. of N and N_4 =C/N at 200 lb./ac. of N.

Basal dose applied on 23.2.1953 and A/S, C/N applied on 16.5.1953 and 24.6.1953 in two equal doses.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×90'-9". (v) No. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 31.28 ton/ac.

(ii) (a) 4.25 ton/ac.

(b) 2.20 ton/ac.

(iii) Sub-plot treatment differences are highly significant, others are not significant.

(iv) Av. yield of sugarcane in ton/ac.

	N_0	N_1	N_2	N_3	N_4	Mean
B_0	24.21	33.25	32.74	36.48	35.43	32.42
B_1	24.63	31.34	32.21	35.03	33.97	31.32
B_2	21.92	27.84	31.04	33.35	36.36	30.10
Mean	23.39	30.81	32.00	34.95	35.25	31.28

S.E. of difference of two

1. B marginal means =1.34 ton/ac.
2. N marginal means =0.91 ton/ac.
3. N means at the same level of B =1.56 ton/ac.
4. B means at the same level of N =1.93 ton/ac.

Crop :-Sugarcane.

Ref :-Pb. 51(37).

Site :-Sugarcane Res. Stn., Jullundur Cantt.

Type :-'M'.

Object :-To test the efficacy of manures received from D.C.M.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur Cantt. (iii) 23.3.1951. (iv) (a) to (e) N.A. (v) 5 ton/ac. as F.Y.M. broadcast on 11.3.1951. (vi) CO-312 (medium). (vii) Irrigated. (viii) 3 weedings cum hoeings and twice tying. (ix) 17.98°. (x) 25.11.1951 to 28.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N_0 =0, N_1 =75 and N_2 =150 lb./ac.

(2) 3 levels of P_2O_5 : P_0 =0, P_1 =50 and P_2 =100 lb./ac.

N supplied through A/S and P_2O_5 through Super.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 90'-9"×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 16.83 ton/ac.
 (ii) 1.96 ton/ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

	N ₀	N ₁	N ₂	Mean
P ₀	13.89	16.35	18.71	16.32
P ₁	14.34	18.33	20.10	17.59
P ₂	14.53	17.09	18.13	16.58
Mean	14.25	17.26	18.98	16.83

S.E. of any marginal mean =0.57 ton/ac.
 S.E. of body of table =0.98 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(115).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :- To test the efficacy of manures received from D.C.M.

1. BASAL CONDITIONS :

- (i) (a) Wheat—G.M.—Fallow—Sugarcane. (b) Fallow. (c) No (ii) (a) Loam. (b) Refer soil analysis, Jullundur Cantt. (iii) 31.3.1952. (iv) (a) 3 *desi hal*, 5 *sohaga*, 1 *raja hal* and 3 tractor ploughings. (b) to (e) N.A. (v) 3 trucks of F.Y.M. (vi) CO-312 (medium). (vii) Irrigated. (viii) 5 hoeings, once earthing up and tying. (ix) 36.61". (x) 17,18.1.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N₀=0, N₁=75 and N₂=150 lb./ac.

(2) 3 levels of P₂O₅ P₀=0, P₁=50 and P₂=100 lb./ac.

N supplied through A/S and P₂O₅ through Super.

A/S applied on 2.6.1952 and 12.7.1952 in equal doses. Super applied on 30.3.1952.

3. DESIGN :

- (i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.42 ton/ac.
 (ii) 2.24 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of sugarcane in ton/ac.

	N ₀	N ₁	N ₂	Mean
P ₀	17.59	17.87	17.31	17.59
P ₁	16.69	18.70	18.45	17.95
P ₂	15.53	16.55	18.12	16.73
Mean	16.60	17.71	17.96 ^{1/2}	17.42

S.E. for any marginal mean =0.65 ton/ac.
 S.E. of body of table =1.12 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(33).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To find out the effect of application of P_2O_5 at various depths.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 15.3.1951.
 (iv) (a) 6 ploughings, 4 *sohaga* and 1 roller. (b) N.A. (c) 40,000 sett/ac. (d) 2' row to row. (e) N.A. (v)
 No. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 27.11.1951 to 30.11.1951.

2. TREATMENTS :

Main-plot treatments :

2 doses of N : $N_0=0$, and $N_1=F.Y.M.$ at 50 lb./ac. of N.

Sub-plot treatments :

7 doses of P : $P_0=Control$, $P_1=Super$ at 50 lb./ac. of P_2O_5 by broadcast, $P_2=Super$ at 50 lb./ac. of P_2O_5 applied 4" deep, $P_3=Super$ at 50 lb./ac. of P_2O_5 applied 6" deep, $P_4=Super$ at 100 lb./ac. of P_2O_5 by broadcast, $P_5=Super$ at 100 lb./ac. of P_2O_5 applied 4" deep, $P_6=Super$ at 100 lb./ac. of P_2O_5 applied 6" deep.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 90'9" x 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane and no. of canes per plot. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 16.64 ton/ac.
 (ii) (a) 1.30 ton/ac.
 (b) 1.22 ton/ac.
 (iii) Only main-plot treatments are significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	P_2	P_3	P_4	P_5	P_6	Mean
N_0	15.90	16.82	15.79	16.38	15.67	15.39	16.19	16.02
N_1	16.81	17.02	17.85	16.74	18.73	16.02	17.69	17.27
Mean	16.31	16.92	16.82	16.56	17.20	15.71	16.94	16.64

S.E. of difference of two

1. N marginal means = 0.35 ton/ac.
 2. P marginal means = 0.61 ton/ac.
 3. P means at the same level of N = 0.86 ton/ac.
 4. N means at the same level of P = 0.87 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(109).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To find out the effect of application of P_2O_5 at various depths.

1. BASAL CONDITIONS :

(i) (a) Wheat—*kharif* fodder—sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 26.2.1952. (iv) (a) 1 tractor ploughing, 3 *desi hal* and 3 *sohaga*. (b) N.A. (c) 35,000 sett/ac. (d) and (e) N.A. (v) No. (vi) CO.312 (medium). (vii) Irrigated. (viii) 8 hoeings. (ix) 36.61". (x) 6.11.1952, 3.12.1952 and 26.12.1952.

2. TREATMENTS :

Main-plot treatments :

2 doses of N : $N_0=0$ and N_1 =F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments :

7 doses of P : P_0 =Control, P_1 =Super at 50 lb./ac. of P_2O_5 by broadcast, P_2 =Super at 50 lb./ac. of P_2O_5 applied 4" deep, P_3 =Super at 50 lb./ac. of P_2O_5 applied 6" deep, P_4 =Super at 100 lb./ac. of P_2O_5 by broadcast, P_5 =Super at 100 lb./ac. of P_2O_5 applied 4" deep, P_6 =Super at 100 lb./ac. of P_2O_5 applied 6" deep.
F.Y.M. on 19.2.1952 and P_2O_5 as Super on 25.2.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4'. (iv) (a) and (b) 99'x10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Pyrrilla attack. Hexalam sprayed on 17.9.1952. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 23.92 ton/ac.
(ii) (a) 2.38 ton/ac.
(b) 2.18 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	P_2	P_3	P_4	P_5	P_6	Mean
N_0	24.81	23.01	25.58	24.82	24.16	25.59	25.46	24.78
N_1	22.65	24.10	22.86	24.35	22.79	23.14	21.56	23.06
Mean	23.73	23.56	24.22	24.58	23.48	24.37	23.51	23.92

S.E. of difference of two

1. N marginal means = 0.64 ton/ac.
2. P marginal means = 1.09 ton/ac.
3. P means at the same level of N = 1.54 ton/ac.
4. N means at the same level of P = 1.56 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 53 (129).

Type :- 'M'.

Object :- To find out the effect of application of P_2O_5 at various depths.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 23.3.1953. (iv) (a) 1 tractor, 3 *desi hal* and 4 *sohaga*. (v) 5 C.L. of F.Y.M. (vi) CO-312 (medium). (vii) Irrigated. (viii) 6 hoeings. (ix) 32.8". (x) 29.12.1953.

2. TREATMENTS :

Main-plot treatments :

2 doses of N : $N_0=0$ and N_1 =F.Y.M. at 50 lb./ac. of N.

Sub-plot treatments :

7 doses of P : $P_0=0$, P_1 =Super at 50 lb./ac. of P_2O_5 by broadcast, P_2 =Super at 50 lb./ac. of P_2O_5 applied 4" deep, P_3 =Super at 50 lb./ac. of P_2O_5 applied 6" deep, P_4 =Super at 100 lb./ac. of P_2O_5 by broadcast, P_5 =Super at 100 lb./ac. of P_2O_5 applied 4" deep and P_6 =Super at 100 lb./ac. of P_2O_5 applied 6" deep.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 99' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination and condition satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 24.97 ton/ac.
 (ii) (a) 5.82 ton/ac.
 (b) 1.78 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	P ₃	P ₄	P ₅	P ₆	Mean
N ₀	23.69	25.66	25.73	23.65	26.26	26.90	25.04	25.28
N ₁	23.99	23.26	25.03	24.76	23.63	25.86	26.06	24.66
Mean	23.84	24.46	25.38	24.21	24.95	26.38	25.55	24.97

S.E. of difference of two

1. N marginal means = 1.56 ton/ac.
2. P marginal means = 0.89 ton/ac.
3. P means at the same level of N = 1.26 ton/ac.
4. N means at the same level of P = 1.94 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 50 (66).

Type :- 'M'.

Object :- To study the response of Sugarcane to different forms of N.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Loam. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS :

1. 100 lb./ac. of N as G.N.C.
2. 100 lb./ac. of N as A/S.
3. 100 lb./ac. of N as C/N.
4. Control (no manure).

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Nil. (iii) Sugarcane count and yield and juice analysis. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 31.67 ton/ac.
 (ii) N.A.
 (iii) Treatment differences are not significant.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	32.25
2.	31.72
3.	32.77
4.	29.95
S.E./mean	= N.A.

Crop :- Sugarcane.

Ref :- Pb. 51(34).

Site :- Sugarcane. Res. Stn., Jullundur.

Type :- 'M'.

Object :- To study the response of Sugarcane to different forms of N.

1. BASAL CONDITIONS :

(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 12.4.1951. (iv) (a) 7 plough, 6 *sohaga* and 2 rollers. (b) N.A. (c) 37,000 sett./ac. (d) 2' row to row. (e) N.A. (v) No. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98%. (x) 18.2.1952.

2. TREATMENTS :

- 100 lb./ac. of N as G.N.C.
- 100 lb./ac. of N as A/S.
- 100 lb./ac. of N as C/N.
- Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 90'-9" × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950-51. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.36 ton/ac.
 (ii) 1.35 ton/ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	17.97
2.	18.76
3.	18.43
4.	14.30
S.E./mean	= 0.60 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 48(29).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To find the optimum time of application of A/S.

1. BASAL CONDITIONS

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) CO.L.-9 (medium). (vii) Irrigated. (viii) N.A. (ix) 26.44%. (x) N.A.

2. TREATMENTS :

1. Full dose at planting.
2. Full dose 50 days after planting.
3. Full dose 80 days after planting.
4. Full dose 110 days after planting.
5. Half dose at planting+half 50 days after planting.
6. Half dose at planting+half 80 days after planting.
7. Half dose at planting+half 110 days after planting.
8. Half 50 days after planting+half 80 days after planting.
9. Half 50 days after planting+half 110 days after planting.
10. Control (no manure).

3. DESIGN :

- (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes

4. GENERAL :

(i) Fair to satisfactory, stand of the crop was not uniform. No lodging. (ii) Nil. (iii) Percentage increase or decrease over full dose at planting and control, juice analysis and sugarcane yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) Nil. (vii) As the farm tube well went out of order the crop had to be sown late.

5. RESULTS :

- (i) 25.39 ton/ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	25.10
2.	29.14
3.	25.37
4.	23.88
5.	28.06
6.	24.59
7.	24.29
8.	25.64
9.	27.06
10.	20.77
S.E./mean	N.A.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 48(28).

Type :- 'M'.

Object :—To find the optimum dose of toria cake and A/S with F.Y.M.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 26.44". (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. F.Y.M. alone.
3. F.Y.M.+A/S in 2 : 1 ratio.
4. F.Y.M.+A/S in 1 : 1 ratio.
5. F.Y.M.+A/S in 1 : 2 ratio.
6. A/S alone.
7. F.Y.M.+toria cake in 2 : 1 ratio.
8. F.Y.M.+toria cake in 1 : 1 ratio.
9. F.Y.M.+toria cake in 1 : 2 ratio.
10. Toria cake alone.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1946—48. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 31.49 ton/ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	29.34
2.	29.25
3.	31.88
4.	31.24
5.	32.78
6.	31.83
7.	31.61
8.	32.72
9.	31.78
10.	32.45
S.E./mean	= N.A.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 53(137).

Type :- 'M'.

Object :- To study the efficacy of different oil cakes.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 7.4.1953. (iv) (a) 1 tractor ploughing, 4 *desi hal*, 1 *hindustan hal* and 4 *sohaga*. (b) N.A. (c) 37,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 4 hoeings. (ix) 32.8". (x) 23,24.12.1954.

2. TREATMENTS :

1. Castor cake at 100 lb./ac. of N.
2. *Neem* cake at 100 lb./ac. of N.
3. G.N.C. at 100 lb./ac. of N.
4. A/S at 100 lb./ac. of N.
5. *Mohwa* cake uncomposted at 100 lb./ac. of N.
6. *Mohwa* cake composted at 100 lb./ac. of N.
7. Fish manure at 100 lb./ac. of N.
8. Control.

A/S applied half on 26.5.1953 and half on 14.7.1953 while other manures were applied on 7.4.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 12' × 90.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 28.56 ton/ac.
 (ii) 2.49 ton/ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	31.11
2.	28.76
3.	28.89
4.	30.21
5.	28.26
6.	26.43
7.	29.41
8.	25.43
S.E./mean	= 1.244 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(133).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :—To compare the manurial value of different parts of Sannhemp at different ages, with and without P_2O_5 at sowing of Sannhemp.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) As per treatments. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 26.2.1953. (iv) (a) 3 *desi hal*, 4 *sohaga* and 3 horse hoe. (b) N.A. (c) 35,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 32.8". (x) 25.2.1954.

2. TREATMENTS :

1. Sannhemp buried after 70 days.
2. Sannhemp buried after 90 days.
3. Only roots of sannhemp buried after 70 days.
4. Roots and the top part of the plant buried after 90 days.
5. Only roots of sannhemp buried after 90 days.
6. Treatment (1)+100 lb./ac. of P_2O_5 at sowing of sannhemp.
7. Treatment (1)+200 lb./ac. of P_2O_5 at sowing of sannhemp.
8. Sannhemp plant (excluding roots) buried after 70 days.
9. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1953-contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 29.68 ton/ac.
(ii) 1.66 ton/ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	32.91
2.	31.35
3.	27.05
4.	30.20
5.	27.15
6.	30.84
7.	31.89
8.	30.45
9.	25.29
S.E./mean	=0.74 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(113).

Site :- Sugarcane Res. Stn. Jullundur.

Type :- 'M'.

Object :- To study the effect of organic and inorganic manures on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 12.4.1952. (iv) (a) 5 *desi hal* and 5 *sohaga*. (b) to (e) N.A. (v) 2 trucks of F.Y.M. on 25.3.1952. (vi) CO-312 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 36.61". (x) 17.11.1952, 19.1.1953, 17.2.1953 and 21.3.1953.

2. TREATMENTS :

1. G.N.C and A/S mixed in the ratio 1 : 1 at 100 lb./ac. of N at planting.
 2. G.N.C at 50 lb./ac. of N at planting + A/S at 50 lb./ac. of N in May and June.
 3. G.N.C. 100 lb./ac. of N at planting.
 4. A/S at 100 lb./ac. of N half in May, June and half in September.
 5. Control.
- A/S and G.N.C mixture on 12.4.1952, A/S to treatments 1 and 4 on 31.5.1952 and A/S to treatment 4 on 1.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 12' x 33'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1952—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.78 ton/ac.
 (ii) 3.10 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	17.93
2.	21.64
3.	18.69
4.	21.47
5.	19.19
S.E./mean	= 1.55 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50(65).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To determine the optimum depth for application of P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS :

1. 100 lb./ac. of P_2O_5 as Super applied by broadcast.
 2. 100 lb./ac. of P_2O_5 as Super applied 6" deep in furrows.
 3. 100 lb./ac. of P_2O_5 as Super applied 12" deep in furrows.
- Manure was applied one day before planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 29.30 ton/ac.
 (ii) N.A.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	29.38
2.	29.46
3.	29.07
S.E./mean	=N.A.

Crop :- Sugarcane.

Ref :- Pb. 51(41).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :- To study the response of Sugarcane to N, P and K fertilizers.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil [analysis, Jullundur. (iii) 27.4.1951.
 (iv) (a) One tractor ploughing, 2 *hindustan* plough. 4 *desi hal* and 6 *sohaga*. (b) N.A. (c) N.A. (d) 2' row to row. (v) Nil. (vi) CO.L. 9 (early). (vii) Irrigated. (viii) 2 hoeings, twice tying up and once earthing up (ix) 17.98°. (x) 22.11.1951 to 21.11.1951.

2. TREATMENTS :

- No manure (control).
 - A/S at 50 lb./ac. of N+Super at 75 lb./ac. of P_2O_5 +Pot. Sul. at 31.25 lb./ac. of K_2O .
 - A/S at 100 lb./ac. of N+Super at 150 lb./ac. of P_2O_5 +Pot. Sul. at 62.5 lb./ac. of K_2O .
 - A/S at 50 lb./ac. of N.
 - A/S at 100 lb./ac. of N.
 - A/S at 50 lb./ac. of N+treatment (2).
 - A/S at 100 lb./ac. of N+treatment (3).
- Half of A/S on 2.6.1951 and the other half of N on 12.7.1951. Super on 1.4.1952 and Pot. Sul. on 1.4.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14.80 ton/ac.
 (ii) 2.04 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	12.30
2.	14.04
3.	15.39
4.	15.19
5.	15.55
6.	14.91
7.	16.21
S.E./mean	= 1.02 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52 (114).

Site :- Sugarcane. Res. Stn., Jullundur.

Type :- 'M'.

Object :—To study the response of Sugarcane to N, P and K fertilizers.

1. BASAL CONDITIONS :

(i) (a) Wheat-G.M.-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 2.4.1952. (iv) (a) 3 *dest hal*, 1 *raja hal*, 5 *sohaga* and 3 tractor ploughings. (b) to (e) N.A. (v) Nil. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 5 hoeing, twice tying up and once earthing up. (ix) 36.61". (x) 18.1.1953.

2. TREATMENTS :

1. No manure (control).
 2. A/S at 50 lb./ac. of N+Super 75 at lb./ac. of P_2O_5 +Pot. Sul. at 31.25 lb./ac. of K_2O .
 3. A/S at 100 lb./ac. of N+Super 150 at lb./ac. of P_2O_5 +Pot. Sul. at 62.50 lb./ac. of K_2O .
 4. A/S at 50 lb./ac. of N.
 5. A/S at 100 lb./ac. of N.
 6. A/S at 50 lb./ac. of N+treatment 2.
 7. A/S at 100 lb./ac. of N+treatment 3.
- A/S applied on 2.6.1952, 12.7.1952 while Super and Pot. Sul. on 1.4.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) and (b) 8'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) Nil. (vii) Originally 4 replications but one replication was ploughed up because of poor growth.

5. RESULTS :

- (i) 13.27 ton/ac.
- (ii) 0.91 ton/ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of sugarcane in lb./ac.

Treatment	Av. yield
1.	10.23
2.	15.65
3.	12.89
4.	13.68
5.	12.62
6.	14.14
7.	13.70
S.E./mean	= 0.52 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50 (67).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'M'.

Object :—To compare the effect of different organic manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS :

1. *Mohwa* cake.
2. *Mohwa* cake composted with soil.
3. *Mohwa* cake composted with lime.
4. *Mohwa* cake composted with A/S.
5. *Mohwa* cake composted with F.Y.M.
6. *Mohwa* cake+F.Y.M. mixed in 1 : 1 ratio.
7. F.Y.M. alone.
8. G.N.C.+F.Y.M. mixed in 1 : 1 ratio.
9. G.N.C. alone
10. Control (no manure).

Total N dose 100 lb./ac. *Mohwa* cake was composted for about 50 days before its application at the time of planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) No. of matured canes/acre, juice analysis and sugarcane yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 39.22 ton/ac.
- (ii) N.A.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	38.73.
2.	40.17
3.	41.11
4.	39.40
5.	38.93
6.	40.13
7.	38.85
8.	38.42
9.	39.14
10.	37.27
S.E./mean	=N.A.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 51(35).

Type :- 'M'.

Object :—To test the efficacy of different oil cakes as manure for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 19.4.1951. (iv) (a) 1 tractor, 1 *hindustan*, 5 *desi* plougings and 6 *sohaga*. (b) N.A. (c) 15,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98°. (x) 9.1.1952 to 11.1.1952.

2. TREATMENTS :

1. *Mohwa* cake.
2. *Mohwa* cake composted with earth.
3. *Mohwa* cake composted with lime.
4. *Mohwa* cake composted with A/S.
5. *Mohwa* cake composted with F.Y.M.
6. *Mohwa* cake+F.Y.M. mixed in 1 : 1 ratio.
7. F.Y.M.
8. G.N.C.+F.Y.M. mixed in 1 : 1 ratio.
9. G.N.C.
10. Control.

N dose was 100 lb./ac. *Mohwa* cake composted and uncomposted was applied on 16.4.1951, F.Y.M. and G.N.C. was applied on 16.4.1951. Half of A/S applied on 16.6.1951 and other half applied on 3.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 90'-9" × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —, (vi) and (vii) Nil.

5. RESULTS :

- (i) 16.31 ton/ac.
 (ii) 1.34 ton/ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	17.28
2.	15.13
3.	17.31
4.	18.17
5.	16.05
6.	16.00
7.	16.49
8.	16.10
9.	17.81
10.	12.76
S.E./mean	= 0.67 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(116).

Site :- Sugarcane Res. Stn., Jullundur Cantt.

Type :- 'M'.

Object :—To study the effect of different manures on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur (iii) 11.3.1952. (iv) (a) 3 *desi hal*, 5 *sohaga* and 2 tractor. (b) to (e) N.A. (v) 2 truck loads of F.Y.M. (vi) CO-312 (medium). (vii) Irrigated. (viii) 6 hoeings. (ix) 36.61". (x) 22.1.1953.

2. TREATMENTS :

1. *Mohwa* cake.
2. *Mohwa* cake composted with earth.
3. *Mohwa* cake composted with lime.
4. *Mohwa* cake composted with A/S.
5. *Mohwa* cake composted with F.Y.M.
6. F.Y.M.+*Mohwa* cake uncomposted mixed in 1 : 1 ratio.
7. F.Y.M.
8. G.N.C.+F.Y.M. mixed in 1 : 1 ratio.
9. G.N.C.
10. Control.

Total dose was 100 lb./ac. All treatments were applied on 12.3.1952 while A/S was applied on 12.7.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 12' × 90'-9". (v) Nil. (vi) Yes.

GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1952, (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

RESULTS :

- (i) 25.78 ton/ac.
 (ii) 2.59 ton/ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	28.07
2.	24.39
3.	25.03
4.	25.67
5.	27.51
6.	24.75
7.	25.49
8.	25.42
9.	26.35
10.	25.12
S.E./mean	= 12.97 ton./ac.

Crop :-Sugarcane.

Ref :-Pb. 48(32).

Site :-Agri. Stn., Karnal.

Type :-'M'.

Object :—To study the effect of different sources of N on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26.3.1948. (iv) (a) to (e) N.A. (v) 10 C.L./ac of F.Y.M. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 30.48". (x) 5.1.1949 to 10.1.1949.

2. TREATMENTS :

1. F.Y.M. at 50 lb./ac. of N.
2. F.Y.M. at 100 lb./ac. of N.
3. A/S at 50 lb./ac. of N.
4. A/S at 100 lb./ac. of N.
5. Ammo. Phos. at 50 lb./ac. of N.
6. Ammo. Phos. at 100 lb./ac. of N.
7. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
8. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. 50 lb./ac. of N.
9. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×80'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Gur yield. (iv) (a) 1946—1948. (b) No. (c) N.A. (v) (a) Ambala. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3.60 ton/ac.
(ii) 0.38 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of gur in ton/ac.

Treatment	Av. yield
1.	3.75
2.	3.69
3.	3.46
4.	3.76
5.	3.46
6.	3.80
7.	3.46
8.	3.51
9.	3.53
S.E./mean	=0.19 ton/ac.

Crop :- Sugarcane.

Site :- Agri. Stn., Karnal.

Ref :- Pb. 49(62).

Type :- 'M'.

Object :- To find out a suitable manure for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 22,23.3.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 25.52". (x) 24.2.1950, 27.2.1950 and 5.3.1950.

2. TREATMENTS :

1. Control.
 2. F.Y.M. at 10 C.L./ac.
 3. *Mohwa* cake at 12.5 md./ac
 4. A/S at 3 md./ac.
 5. Ammo. Phos. at 4 md./ac.
 6. F.Y.M. at 5 C.L./ac.+A/S at 1.5 md./ac.
 7. F.Y.M. at 5 C.L./ac.+Ammo. Phos. at 2 md./ac.
 8. *Mohwa* cake at 6.25 md./ac.+A/S at 1.5 md./ac.
 9. *Mohwa* cake at 6.25 md./ac.+Ammo. Phos. at, md./ac.
- Mohwa* cake and F.Y.M. on 20.3.1949. A/S and Ammo. Phos. on 9.7.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 11' x 76'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A.. (iii) Juice, *gur* and sugarcane yield. (iv) (a) and (b) No. (c) —. (v) (a) No. (1) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 29.12 ton/ac.
- (ii) 3.49 ton/ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	23.41
2.	30.13
3.	25.63
4.	34.03
5.	30.38
6.	28.32
7.	31.16
8.	29.77
9.	29.22
S.E./mean	=1.75 ton./ac.

Crop : Sugarcane.

Site :- Agri. Res. Stn., Karnal.

Ref :- Pb. 51(60).

Type :- 'M'.

Object :- To study the effect of A/S and Super on the yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9,10.3.1951. (iv) (a) 6 ploughings and 4 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 1 weeding, 2 hoeings and twice tying up. (ix) 16.86". (x) 1.1.1952, 12.1.1952, 18.1.1952 and 22.2.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of P₂O₅ as Super : P₀=0, P₁=50 and P₂=100 lb./ac.(2) 3 levels of N as A/S : N₁=50, N₂=100 and N₃=150 lb./ac.

A/S and Super applied on 8.6.1951.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) 8'×76'. (b) 8'×69.8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Very good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) No. (vii) Originally conducted with 6 replications, but data for only 5 replications was available.

5. RESULTS :

(i) 3.33 ton/ac.
 (ii) 0.39 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P ₀	P ₁	P ₂	Mean
N ₁	2.89	3.13	2.97	3.00
N ₂	2.99	3.20	3.14	3.11
N ₃	2.88	3.01	3.05	2.98
Mean	2.92	3.11	3.05	3.03

S.E. of marginal mean of N or P = 0.10 ton/ac.
 S.E. of body of table = 0.175 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(74).

Site :- Chemical Section, B.A. Farm, Rauni.

Type :- 'M'

Object :- To find out the best dose of N for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Metha* (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 29.3.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 *sohaga* for facilitating germination and 2 hoeings. (ix) 23.05". (x) N.A.

2. TREATMENTS :

1. Control.
2. 400 lb./ac. of A/S.
3. 600 lb./ac. of A/S.
4. 800 lb./ac. of A/S.

A/S applied in three equal doses on 1.16.1952, 19.7.1952 and 16.9.1952 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 67'×20.3'. (b) 1/45 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination poor. No lodging. (ii) Affected plants were treated by removing central shoots and spiking it. (iii) Yield of sugarcane and *gur* yield for 2nd replication only. (iv) (a) to (c) No. (v) (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 26.04 ton/ac.
 (ii) 23.43 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	26.35
2.	23.82
3.	25.67
4.	28.31
S.E./mean	= 1.72 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(107).

Site :- Chemical Section, B.A. Farm, Rauni.

Type :- 'M'.

Object :- To find out the best dose of N for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.3.1953. (iv) (a) 6 ploughings and 5 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 30.50'. (x) 18.3.1954.

2. TREATMENTS :

1. Control.
 2. 80 lb./ac. of N as A/S.
 3. 120 lb./ac. of N as A/S.
 4. 160 lb./ac. of N as A/S.
- Fertilizers were applied in 3 equal doses.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 67' × 20.35'. (b) 1/45 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15.83 ton/ac.
- (ii) 2.13 ton/ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	12.07
2.	15.06
3.	17.81
4.	18.37
S.E./mean	= 1.07 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 48(57).

Site :- Agri. Farm, Rohtak.

Type :- 'M'.

Object :- To study the effect of N on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 18.3.1948. (iv) (a) and (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) F.Y.M. at 10 C.L./ac. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 23.6". (x) 6.1.1949 to 16.1.1949.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
 2. A/S at 100 lb./ac. of N.
 3. F.Y.M. at 10 C.L./ac.
 4. Control.
- A/S applied on 2.7.1948 and F.Y.M. before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 12' × 132'. (b) 12' × 90'-9". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Yield of *gur*. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Germination in plots having treatments 1, 2, and 3 was poor as compared to plot 4 and hence control is giving higher yield.

5. RESULTS :

- (i) 4.22 ton/ac.
 (ii) 1.72 ton/ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *gur* in ton/ac.

Treatment	Av. yield
1.	3.91
2.	3.93
3.	4.50
4.	4.52
S.E./mean	= 0.77 ton/ac

Crop :- Sugarcane.

Site :- Agri. Farm, Rohtak.

Ref :- Pb. 49 (86).

Type :- 'M'.

Object : To find out the best manure for Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 19.3.1949.
 (iv) (a) One *raja*, 4 *dasi* plough and 8 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) Nil.
 (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.89". (x) 11.2.1950 to 25.2.1950.

2. TREATMENTS :

- No manure.
- F.Y.M. at 10 C.L./ac.
- Mohwa* cake at 12.5 md./ac.
- A/S at 3 md./ac.
- Ammo. Phos. at 4 md./ac.
- F.Y.M. at 5 C.L.+A/S at 1½ m.l./ac.
- F.Y.M. at 5 C.L.+Ammo. Phos. at 2 md./ac.
- Mohwa* cake at 6.25 md./ac.+A/S at 1½ md./ac.
- Mohwa* cake at 6.25 md./ac.+Ammo. Phos. at 2 md./ac.

3. DESIGN :

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'×72'-7". (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Yield of *gur*. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No.
 (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3.49 ton/ac.
 (ii) 0.34 ton/ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of *gur* in ton/ac.

Treatment	Av. yield
1.	3.18
2.	3.30
3.	2.99
4.	3.75
5.	3.78
6.	3.80
7.	3.46
8.	3.55
9.	3.58
S.E./mean	=0.17 ton/ac.

Crop :- Sugarcane.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 50(96).
Type :- 'M'.

Object :—To find out the best manure for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 31.3.1950. (iv) (a) 1 *raja*, 4 *desi* and 6 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) N.A. (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) 2 hoeings, once ridging and tying up. (ix) 14.35%. (x) 2.1.1951 to 29.1.1951.

2. TREATMENTS :

1. No manure.
2. F.Y.M. at 10 C.L./ac.
3. *Mohwa* cake at 12.5 md./ac.
4. A/S at 3 md./ac.
5. Ammo. Phos. at 4 md./ac.
6. F.Y.M. at 5 C.L./ac. + A/S 1½ md./ac.
7. F.Y.M. at 5 C.L./ac. + Ammo. Phos. at 2 md./ac.
8. *Mohwa* cake at 6.25 md./ac. + A/S at 1½ md./ac.
9. *Mohwa* cake at 6.25 md./ac. + Ammo. Phos. 2 md./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 15'×77'. (b) 15'×72'-7". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of *gur*. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3.48 ton/ac.
(ii) 0.32 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of *gur* in ton/ac.

Treatment	Av. yield
1.	3.20
2.	3.18
3.	3.27
4.	3.74
5.	3.76
6.	3.62
7.	3.58
8.	3.51
9.	3.47
S.E./mean	= 0.16 ton/ac.

Crop :- Sugarcane.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 51(54).
Type :- 'M'.

Object :—To find out the best manure for Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Rohtak. (iii) 10.3.1951. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO-312 (medium). (vii) Irrigated. (viii) twice tying up and 2 hoeings. (ix) 8.72%. (x) 19.1.1952 to 24.1.1952.

2. TREATMENTS :

1. No manure.
 2. F.Y.M. at 10 C.L./ac.
 3. *Mohwa* cake at 12.5 md./ac.
 4. A/S at 3 md./ac.
 5. Ammo. Phos. at 4 md./ac.
 6. F.Y.M. at 5 C.L./ac. + A/S at 1½ md./ac.
 7. F.Y.M. at 5 C.L./ac. + Ammo. Phos. at 2 md./ac.
 8. *Mohwa* cake at 6.25 md./ac. + A/S at 1½ md./ac.
 9. *Mohwa* cake at 6.25 md./ac. + Ammo. Phos. at 2 md./ac.
- F.Y.M. and *Mohwa* cake applied on 16.2.1951 by broadcast.

3. DESIGN :

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 64'×88'. (b) 64'×18'. (v) Nil (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane and *gur*. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 39.13 ton/ac.
 (ii) 2.40 ton/ac.
 (iii) Treatments are not significant.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	38.88
2.	36.58
3.	39.81
4.	39.15
5.	39.91
6.	40.10
7.	38.98
8.	39.49
9.	39.25
S.E./mean	= 1.20 ton/ac.

Crop :- Sugarcane

Site :- Agri. Farm, Rohtak.

Ref :- Pb. 52(129).

Type :- 'M'.

Object :- To study the best manurial combination for Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Rohtak. (iii) 27.3.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) CO-312 (late). (vii) Irrigated. (viii) Yes. (ix) 22.63%. (x) 28.1.1953 to 2.2.1953.

2. TREATMENTS :

1. No manure.
 2. F.Y.M. at 10 C.L./ac.
 3. *Mohwa* cake at 12.5 md./ac.
 4. A/S at 3 md./ac.
 5. Ammo. Phos. at 4 md./ac.
 6. F.Y.M. at 5 C.L./ac. + A/S at 1½ md./ac.
 7. F.Y.M. at 5 C.L./ac. + Ammo. Phos. at 2 md./ac.
 8. *Mohwa* cake at 6.25 md./ac. + A/S at 1½ md./ac.
 9. *Mohwa* cake at 6.25 md./ac. + Ammo. Phos. at 2 md./ac.
- F.Y.M. and *Mohwa* cake applied in middle of Feb.

3. DESIGN :

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 60'×14½'. (v) 2' le on both sides of length. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Attack of white ant, stem borer, top borer and pyrilla. Control measures nil. (iii) Yield of sugarcane. (iv) (a) 1949—1952. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1.81 ton/ac.
 (ii) 0.20 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	1.75
2.	1.76
3.	1.75
4.	1.56
5.	1.68
6.	1.91
7.	1.82
8.	2.02
9.	2.01
S.E/mean	= 0.10 ton/ac.

Crop :- Sugarcane. Ref :- Pb. 53(148). (experiment on cultivators' field).

Site :- Jagadhri, Distt. Ambala.

Type :- 'M'.

Object :—To find the effect of N, P and K on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Loam to sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO-453 (improved). (v) (a) to (e) N.A. (vi) Feb. 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Feb. to March 1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 2 levels of N as A/S : $N_0=0$ and $N_1=50$ lb./ac.
 (2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.
 (3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=50$ lb./ac.

Manures applied at the time of planting.

3. DESIGN :

(i) and (ii) 4 fields were selected in each of the 10 villages according to the soil type. Each field is taken as a replication having 8 plots. (iii) (a) N.A. (b) 1/48 ac. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Germination, tillering, sugarcane yield and juice analysis. (iv) (a) 1953—1956. (continued in other regions). (b) N.A. (v) Nil. (vi) Experiment conducted in 10 villages of Jagadhri Tehsil.

5. RESULTS :

- (i) 16.451 ton/ac.
 (ii) 2.1236 ton/ac.
 (iii) Only N effect is highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	14.785	15.264	15.024	15.154	14.895
N_1	17.722	18.034	17.878	17.848	17.908
Mean	16.254	16.649	16.451	16.501	16.402
K_0	16.206	16.796	16.501		
K_1	16.301	16.502	16.402		

S.E. of marginal means of N, P or K = 0.168 ton/ac.
 S.E. of body of table = 0.237 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(158). Experiment on cultivators' fields.

Site :- Jagadhri.

Distt. Ambala.

Type :- 'M'.

Object :—To find out the effect of N,P and K fertilizers on Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 10 C.L./ac. of F.Y.M. (iv) CO.L. 9 (improved).
 (v) (a) to (e) N.A. (vi) March 1953. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) March 1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=50$ lb./ac.(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.(3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=50$ lb./ac.

Manures applied along with planting.

3. DESIGN :

(i) and (ii) R.B.D. Replications—2. Fields were selected according to soil type. (iii) (a) N.A. (b) 1/55 th ac.
 (iv) N.A.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Germination, growth and yield of sugarcane. (iv) —. (v) and (vi) Nil.

5. RESULTS :

(i) 16.42 ton/ac.

(ii) 2.615 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	P_0	P_1	Mean	K_0	K_1
N_0	17.17	15.13	16.15	16.15	16.14
N_1	16.70	16.69	16.69	17.05	16.34
Mean	16.93	15.91	16.42	16.60	16.24
K_0	17.90	15.30	16.60		
K_1	15.97	16.52	16.24		

S.E. of marginal mean of N, P or K
 S.E. of body of table

=0.925 ton/ac.

=1.308 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(52).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'MV'.

Object :—To study the effect of different forms of N in presence and absence of P_2O_5 on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.4.1952. (iv) (a) 15 *desi hal*, 12 *sohaga*.
 (b) and (c) N.A. (d) 2' row to row. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii)
 5 hoeings and 1 ridging. (ix) 23.50". (x) 2.2.1953 to 9.2.1953.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =CO.312 (early) and V_2 =CO.L. 9 (early).

Sub-plot treatments :

All combinations of (1) and (2).

(1) 2 levels of P_2O_5 : $P_0=0$ and $P_1=100$ lb./ac.

(2) 4 doses of N : $N_0=0$ and $N_1=140$ lb./ac. as A/S., $N_2=140$ lb./ac. as G.N.C. and $N_3=140$ lb./ac. as F.Y.M.

P_2O_5 as Super applied 4" deep in furrows on 4.4.1952. G.N.C. and F.Y.M. applied with hoeing on 12.5.1952 and A/S with irrigation on 10.6.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 16'×77'. (b) 16'×63½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Stand and condition of V_1 was good while that of V_2 was poor to fair. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) Yes. 1952 to 1954 (conducted with one variety only after 1952). (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 17.27 ton/ac.
 (ii) (a) 14.48 ton/ac.
 (b) 3.31 ton/ac.
 (iii) Sub-plot treatment effect is highly significant, while main-plot treatment effect and interaction between main-plots×sub-plots are not significant.
 (iv) Av. yield of stripped cane in ton/ac.

	P_0	P_1	Mean	V_1	V_2
N_0	15.77	13.80	14.79	15.76	13.81
N_1	19.13	19.36	19.25	20.29	18.21
N_2	16.36	19.77	18.07	18.41	17.72
N_3	18.49	15.43	16.96	18.47	15.45
Mean	17.44	17.09	17.27	18.23	16.30
V_1	18.20	18.26	18.23		
V_2	16.68	15.92	16.30		

S.E. of difference of two

V marginal means	=3.62 ton/ac.
N marginal means	=1.17 ton/ac.
P marginal means	=0.83 ton/ac.
N means at the same level of V	=1.66 ton/ac.
V means at the same level of N	=3.71 ton/ac.
P means at the same level of V	=1.17 ton/ac.
V means at the same level of P	=3.89 ton/ac.
means in body of N×P table	=1.65 ton/ac.

Crop :- Sugarcane.

Site :- Govt. Agri. Stn. Gurdaspur.

Ref :- Pb. 48(9).

Type :- 'C'.

Object :- To find out suitable spacing and seed rate for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 29.9.1948. (iv) (a) 1 raja plough, 4 desi and 5 sohaga. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) CO.313 (medium). (vii) Irrigated. (viii) 2-3 hoeings and 1 ridging. (ix) 27.27". (x) 18.2.1949, 23.3.1949 and 1.4.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 seed rates : $R_1=20,000$, $R_2=30,000$ and $R_3=40,000$ sett/ac.(2) 2 spacings : $S_1=1'$ and $S_2=2'$ row to row.**3. DESIGN :**(i) 3×2 Fact, in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) $82.5' \times 12'$. (b) $72.6' \times 12'$. (v) N.A. (vi) Yes.**4. GENERAL :**

(i) Germination satisfactory and growth normal. No lodging. (ii) Slight attack of stem borer. No control measures taken. (iii) stripped cane yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 9.66 ton/ac.

(ii) 1.19 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of stripped cane in ton/ac.

	S_1	S_2	Mean
R_1	9.28	9.33	9.31
R_2	9.08	9.94	9.51
R_3	9.83	10.48	10.16
Mean	9.40	9.92	9.66

S.E. of marginal mean of R

=0.34 ton/ac.

S.E. of marginal mean of S

=0.28 ton/ac.

S.E. of body of table

=0.49 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49(53).

Site :- Sugarcane Sub. Stn. Gurdaspur.

Type :- 'C'.

Object :- To find out the optimum depth of sowing Sugarcane.

1. BASAL CONDITIONS :(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 24.3.1949. (iv) (a) 4 ploughings and 5 *sohaga*. (b) to (e) N.A. (v) 30 C.L./ac. of F.Y.M. (vi) CO.K. 30 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78". (x) 14.1.1950.**2. TREATMENTS :**

4 depths of sowing :

 $S_1=2.5''$, $S_2=3''$, $S_3=3.5''$ and $S_4=4''$ depth.**3. DESIGN :**(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) $16' \times 70.5'$. (v) N.A. (vi) Yes.**4. GENERAL :**

(i) Satisfactory. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil. -

5. RESULTS :

(i) 34.39 ton/ac.

(ii) 1.33 ton/ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of stripped cane in ton/ac.

Treatment	Av. yield
S ₁	34.53
S ₂	33.18
S ₃	34.14
S ₄	35.72
S.E./mean	= 0.94 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49 (55).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'C'.

Object :- To study the effect of different seed rates and spacing on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 28.3.1949. (iv) (a) to (e) N.A. (v) 22 C.L./ac. of F.Y.M. (vi) CO. 313 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78°. (x) 8.12.1949 to 10.12.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 seed rates : R₁=20,000, R₂=30,000 and R₃=40,000 setts/ac.

(2) 2 spacings : S₁=1' and S₂=2' apart.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 16'×80'. (b) 16'×68.06'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Stripped sugarcane. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.60 ton/ac.

(ii) 1.812 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of stripped cane in ton/ac.

	R ₁	R ₂	R ₃	Mean
S ₁	22.89	23.94	23.60	23.48
S ₂	23.42	23.25	24.50	23.72
Mean	23.16	23.60	24.05	23.60

S.E. of marginal mean of R = 0.523 ton/ac.

S.E. of marginal mean of S = 0.427 ton/ac.

S.E. of body of table = 0.740 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(274).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'C'.

Object :- To find the optimum time for planting Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) *Kharif* fodder—*Senji*—Sugarcane. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 *desi* *hal*, 1 bar harrow and 5 *sohaga*. (b) By hand. (c) 32,000 setts/ac. (d) Row to row 2'. (e) One sett of two buds. (v) F.Y.M. at 10 C.L./ac. on 26.2.1953 and A/S at 80 lb./ac. of N on 13.18.6.1954. (vi) CO.312. (vii) Irrigated. (viii) 3 hoeings. (ix) 37.46°. (x) 1st and 2nd treatments harvested in 3rd and 4th week of December 1954, 3rd in last week of November 1954 and 4th in 1st week of January 1955.

2. TREATMENTS :

1. October planting after fallow with *masser* 24,25.10.1953.
2. October planting after fallow with out *masser* 24,25.10.1953.
3. March planting after fallow 29.3.1954.
4. April planting after fallow 30.4.1954.
5. April planting after *masser* 30.4.1954.
6. April planting after wheat 30.4.1954.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 20'×78' (b) 20'×62'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) N.A. (iii) Sugarcane yield. (iv) (a) 1953-54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 29.59 ton/ac.
 (ii) 2.71 ton/ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	29.59
2.	33.22
3.	34.07
4.	28.97
5.	27.47
6.	24.24
S.E./mean	= 1.36 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 48(30).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of different spacings and depths of sowing on yield of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 26.44". (x) N.A.

2. TREATMENTS :

1. Sowing 1' apart on flat.
2. Sowing 2' apart on flat and ridge.
3. Sowing 2' apart in 6" deep trenches.
4. Sowing 2' apart in 1' deep trenches.
5. Sowing 3' apart on flat and ridge.
6. Sowing 3' apart in 6" deep trenches.
7. Sowing 3' apart in 1' deep trenches.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. Slight lodging. (ii) Attack of white-ants. (iii) Sugarcane yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 30.40 ton/ac.
 (ii) N.A.
 (iii) N.A.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	30.83
2.	32.85
3.	28.58
4.	31.37
5.	29.09
6.	30.24
7.	29.83
S.E./mean	=N.A.

Crop :- Sugarcane.

Ref :- Pb. 49(60).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of different spacings and depths of sowing on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 18.67%. (x) N.A.

2. TREATMENTS :

1. Sowing 1' apart on flat.
2. Sowing 2' apart on flat and ridge.
3. Sowing 2' apart ordinary trenches.
4. Sowing 2' apart 1' deep trenches.
5. Sowing 3' apart on flat and ridge.
6. Sowing 3' apart ordinary trenches.
7. Sowing 3' apart 1' deep trenches.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. Slight lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1948 to 1949. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 27.96 ton/ac.

(ii) N.A.

(iii) N.A.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	30.00
2.	30.64
3.	29.87
4.	25.04
5.	28.47
6.	28.86
7.	22.83
S.E./mean	=N.A.

Crop :- Sugarcane.

Ref :- Pb. 50(69).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of different cultural practices on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) 50.12". (x) N.A.

2. TREATMENTS :

1. Control.
2. Weeding alone.
3. 5 hand hoeings.
4. 5 bullock hoeings.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Sugarcane yield, germination and no. of matured cane/ac. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 34.81 ton/ac.
- (ii) 4.74 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	20.28
2.	38.73
3.	40.33
4.	39.91
S.E./mean	= 2.12 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50(70).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of planting two-budded and three-budded setts on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) CO. L. 9 (medium). (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS :

1. Planting two budded setts.
2. Planting three budded setts.

3. DESIGN :

(i) Paired. plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Sugarcane yield, germination and sugarcane count. (iv) (a) 1950-1951. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 25.69 ton/ac.
- (ii) N.A.
- (iii) Treatments are not significantly different.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	25.82
2.	25.55
S.E./mean	=N.A.

Crop :- Sugarcane.

Ref :- Pb. 51(36).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of planting two-budded and three-budded setts on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 21.4.1951. (iv) (a) 6 ploughings and 8 *sohaga*. (b) N.A. (c) (1) 40,000 sett/ac. (2) 27,333 sett/ac. (d) and (e) N.A. (v) Two doses each of 70 lb./ac. of N as A/S applied on 18.6.1951 and 13.7.1951. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 4 hoeings and 2 tying ups. (ix) 17.98". (x) 19.2.1952 and 7.3.1952.

2. TREATMENTS :

Crop sown with
1. Two-budded setts.
2. Three-budded setts.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 90'-9" × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1950-1951. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.08 ton/ac.
(ii) 1.45 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	16.41
2.	15.75
S.E./mean	= 0.65 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(48).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of burying cane before frost (end of Nov.) on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 20.4.1951. (iv) (a) 8 *desi hal* and 6 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) 2' row to row. (e) N.A. (v) N.A. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 20,22.12.1951.

2. TREATMENTS :

All possible combinations of (1) and (2)
(1) Portions planted : C₁=Top, C₂=Middle and C₃=Bottom.
(2) Methods : S₁=Buried, S₂=Fresh and S₃=Fresh soaked.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Stripped cane yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 8.62 ton/ac.
 (ii) 2.05 ton/ac.
 (iii) Main effect of S is highly significant. Interaction C×S is significant.
 (iv) Av. yield of sugarcane in ton/ac.

	C ₁	C ₂	C ₃	Mean
S ₁	8.48	12.08	9.79	10.12
S ₂	6.25	7.61	7.03	6.96
S ₃	8.18	6.88	11.25	8.77
Mean	7.64	8.86	9.36	8.62

S.E. of any marginal mean = 0.59 ton/ac.
 S.E. of body of table = 1.03 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(121).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :- To study the effect of burying cane before frost (end of Nov.) on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 4.4.1952.
 (iv) (a) 3 *dest hal*, 6 *sohaga* and 1 roller. (b) to (e) N.A. (v) 8 ton/ac. of F.Y.M. on 13.3.1952.
 (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 earthing up and twice tying up. (ix) 36.61%.
 (x) 11.1.1953.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) Portions planted : C₁=Top, C₂=Middle and C₃=Bottom.
 (2) 3 methods : S₁=Buried, S₂=Fresh and S₃=Fresh soaked.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1950 to 1952. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14.92 ton/ac.
 (ii) 3.60 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of stripped cane in ton/ac.

	C ₁	C ₂	C ₃	Mean
S ₁	13.89	20.49	14.79	16.39
S ₂	14.38	12.02	14.79	13.73
S ₃	13.54	10.70	19.72	14.65
Mean	13.94	14.40	16.43	14.92

S.E. of any marginal mean = 1.20 ton/ac.
 S.E. of body of table = 2.08 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50 (68).

Site :- Sugarcane Res. Stn., Jullundur

Type :- 'C'.

Object :—To study the effect of seasonal planting of Sugarcane on its yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Lomy. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) CO-312 (medium). (vii) Irrigated. (viii) N.A. (ix) 50.12%. (x) N.A.

2. TREATMENTS :

1. Planted in October 1949.
2. Planted in December 1949.
3. Planted in March 1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) No. of matured canes/ac., juice analysis and yield of sugarcane. (iv) (a) 1950—1953 (continued with modifications after 1950). (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 37.91 ton/ac.
 (ii) N.A.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of stripped cane in ton/ac.

Treatment	Av. yield
1.	37.66
2.	38.56
3.	37.50
S.E./mean	= N.A.

Crop :- Sugarcane.

Ref :- Pb. 51(42).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of different dates of planting of Sugarcane on its yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) to (e) N.A. (v) 18 trucks of F.Y.M. to supply 200 lb./ac. of N. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98%. (v) N.A.

2. TREATMENTS :

8 dates of planting :

1. 12th March 1951.
2. 22nd March 1951.
3. 20th April 1951.
4. 28th April 1951.
5. 23rd Sept. 1951.
6. 28th Sept. 1951.
7. 16th Dec. 1951.
8. 26th Dec. 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 20.66 ton/ac.
 (ii) 2.35 ton/ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	19.69
2.	18.84
3.	17.02
4.	14.28
5.	27.62
6.	24.91
7.	26.46
8.	16.48
S.E./mean	= 1.05 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(124).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object:—To study the effect of different dates of planting of Sugarcane on its yield.

1. BASAL CONDITIONS :

(i) (a) Wheat-Kharif fodder-Sugarcane. (b) Kharif fodder. (c) No. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 4 *desi hal*, 1 *hindustan hal* and 4 *sohaga*. (b) to (e) N.A. (v) 35 C.L. of F.Y.M. as basal dressing. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 4 hoeings, 2 to 3 tying up and 1 earthing up. (ix) 60.01* (from March 1952 to Jan. 1954). (x) 17.2.1954

2. TREATMENTS :

8 dates of planting :

1. 10th March 1952.
2. 18th March 1952.
3. 12th April 1952.
4. 22nd April 1952.
5. 15th Sept. 1952.
6. 22nd Sept. 1952.
7. 10th Dec. 1952.
8. 22nd Dec. 1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 30.13 ton/ac.
 (ii) 2.18 ton/ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	33.22
2.	30.94
3.	25.08
4.	19.15
5.	36.98
6.	29.49
7.	35.22
8.	30.94
S.E./mean	= 0.97 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(132).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To study the effect of different dates of planting of Sugarcane on its yield.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif fodder-Sugarcane. (b) Kharif fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) 5 *desi hal*, 6 *sohaga*, 1 *hindustan* plough and 2 horse hoe. (b) N.A. (c) 37,000 sett/ac. (d) and (e) N.A. (v) 32 C.L. of F.Y.M. on 14.9.1953. (vi) CO.312 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 32.8". (x) 8.4.1955.

2. TREATMENTS :

8 dates of planting :—

1. 8th March 1953.
2. 25th March 1953.
3. 10th April 1953.
4. 26th April 1953.
5. 14th Sept. 1953.
6. 24th Sept. 1953.
7. 8th Dec. 1953.
8. 23rd Dec. 1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) and (b) 99.75' × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) 14 lb. B.H.C. used for Sept. planted canes against white ants on 28.9.1953. (iii) Yield of sugarcane. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 25.42 ton/ac.
 (ii) 2.79 ton/ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	28.21
2.	27.53
3.	19.72
4.	17.22
5.	28.01
6.	29.69
7.	27.61
8.	25.33
S.E./mean	= 1.25 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(128).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'C'.

Object :—To find out the optimum seed rate for planting Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 8.3.1953. (iv) (a) 4 *desi hal*, 2 *sohaga* and 2 *tractor*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 200 md/ac. of F.Y.M. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 6 hoeings and 1 earthing up. (ix) 32.8". (x) 17.1.1954.

2. TREATMENTS :

3 seed rates :—

1. 20,000 sett/ac.
2. 30,000 sett/ac.
3. 40,000 sett/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) and (b) 1/40th ac. (v) No. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 22.00 ton/ac.
 (ii) 1.19 ton/ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	20.39
2.	22.57
3.	23.03
S.E./mean	=0.60 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50(59).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'CV'.

Object :- To study the effect of variation in number of buds/sett on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 8.4.1950. (iv) (a) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. and 2 md. and 4 sr. of A/S on 30.5.1950. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 55.35°. (x) 13.3.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 kinds of setts : $S_1=1$ -budded and $S_2=2$ -budded.
 (2) 2 varieties : $V_1=CO. 312$ (medium) and $V_2=CO.K. 30$ (medium).

3. DESIGN :

(i) 2x2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 24'x46'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) No. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 30.21 ton/ac.
 (ii) 3.57 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

	S_1	S_2	Mean
V_1	29.69	33.22	31.46
V_2	28.57	29.35	28.96
Mean	29.13	31.29	30.21

S.E. of any marginal mean = 1.03 ton/ac.
 S.E. of body of table = 1.46 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(109).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'CV'.

Object :- To study the effect of variation in number of buds/sett on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 2.4.1951. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 36000 setts/ac. (2-budded) ; 24000 sett/ac. (3-budded). (d) and (e) N.A. (v) 44 C.L./ac. of F.Y.M. ; A/S at 40 lb./ac. of N on 28.5.1951 and at 30 lb./ac. of N on 5.7.1951. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 25.67". (x) 18.1.1952 and 21.1.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 kinds of setts : $S_1=2$ -budded and $S_2=3$ -budded.(2) 2 varieties : $V_1=CO. 312$ (medium) and $V_2=CO.K. 30$ (medium).

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 10. (iv) (a) $16' \times 63'$. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.03 ton/ac.

(ii) 2.077 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of sugarcane in ton/ac.

	S_1	S_2	Mean
V_1	22.75	23.46	23.11
V_2	22.71	23.18	22.95
Mean	22.73	23.32	23.03

S.E. of any marginal mean = 0.465 ton/ac.

S.E. of body of table = 0.657 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51 (45).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'CV'.

Object :- To study the effect of sowing setts with and without trash and some cultural treatments on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat-*kharif* fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 8.4.1951. (iv) (a) and (b) N.A. (c) 100 setts/plot. (d) and (e) N.A. (v) 43 lb./ac. of A/S on 13.6.1951 and 154 lb./ac. of A/S on 29.6.1951. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings and 2 tying up. (ix) 17.98". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 varieties : $V_1=CO. 312$ and $V_2=CO.L. 9$.(2) 2 hoeings : $H_1=Blind$ hoeing and $H_2=No$ blind hoeing.(3) 4 kinds of setts : $T_1=Stripped$ cane fresh, $T_2=setts$ with trash, $T_3=Stripped$ cane soaked in water for 24 hours and $T_4=Stripped$ cane soaked in 1% D.D.T. solution.

3. DESIGN :

(i) 2×2×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Below normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Experiment during 1952 dropped.

5. RESULTS :

- (i) 17.84 ton/ac.
 (ii) 6.30 ton/ac.
 (iii) Only varieties are significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	Mean	H ₁	H ₂
T ₁	16.02	14.12	15.07	13.31	16.83
T ₂	21.59	15.16	18.37	17.58	19.17
T ₃	21.30	17.74	19.52	20.84	18.21
T ₄	19.53	17.29	18.41	20.08	16.75
Mean	19.61	16.08	17.84	17.95	17.74
H ₁	19.44	16.46	17.95		
H ₂	19.78	15.69	17.74		

S.E. of marginal mean of T = 1.57 ton/ac.
 S.E. of marginal mean of V or H = 1.11 ton/ac.
 S.E. of body of tables V×T and H×T = 2.23 ton/ac.
 S.E. of body of table V×H = 1.57 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53 (139).

Site :- Sugarcane Res. Stn., Jullundur.

Type 'CV'.

Object :- To study the effect of sowing sugarcane with and without trash and some cultural treatments on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 26.3.1953. (iv) (a) to (e) N.A. (v) 5 trucks of F.Y.M. on 9.2.1953; 50 lb./ac. of N as A/S on 17.5.1953 and 50 lb./ac. of N as A/S on 23.7.1953. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings and twice earthing up. (ix) 32.8". (x) 4.2.1954.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 varieties : V₁=CO. 312 and V₂=CO.L. 9.

(2) 2 hoeings : H₁=Blind hoeing and H₂=No blind hoeing.

(3) 4 kinds of setts : T₁=Stripped cane fresh, T₂=Setts with trash, T₃=Stripped cane soaked in water for 24 hours and T₄=Stripped cane soaked in 1% D.D.T. solution.

3. DESIGN :

(i) 2×2×4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Below normal. No lodging. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.30 ton/ac.
(ii) 5.82 ton/ac.
(iii) Varieties as well as hoeings are highly significantly different, while others are not significant.
(iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	Mean	H ₁	H ₂
T ₁	23.83	17.53	20.68	22.89	18.47
T ₂	23.00	13.99	18.49	23.28	13.70
T ₃	24.95	14.19	19.57	22.71	16.43
T ₄	24.56	12.35	18.46	18.91	18.00
Mean	24.09	14.52	19.30	21.95	16.65
H ₁	25.80	18.10	21.95		
H ₂	22.37	10.93	16.65		

S.E. of marginal mean of T = 1.45 ton/ac.
S.E. of marginal mean of V and H = 1.03 ton/ac.
S.E. of body of tables V×T and H×T = 2.06 ton/ac.
S.E. of body of table V×H = 1.45 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(141).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'CV'.

Object :—To study the effect of sowing setts with and without trash and some cultural treatments, on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 11.4.1953. (iv) (a) to (e) N.A. (v) 5 trucks of F.Y.M. on 9.2.1953, 50 lb./ac. of N as A/S on 17.5.1953 and 50 lb./ac. of N as A/S on 23.7.1953. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) 32.8". (x) 25.12.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 2 varieties : V₁=CO.312 and V₂=CO.L.9.
(2) 2 hoeings : H₁=Blind hoeing and H₂=No blind hoeing.
(3) 4 kinds of setts : T₁=Stripped cane—fresh, T₂=Setts with trash, T₃=Stripped cane soaked in water for 24 hours and T₄=Stripped cane soaked in D.D.T. 1% solution.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Below normal. No lodging. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) Not contd. (b) No. (c) —.
(v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 21.11 ton/ac.
(ii) 4.31 ton/ac.
(iii) Varieties and hoeings are highly significantly different while others are not significant.

(iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	Mean	H ₁	H ₂
T ₁	25.11	18.42	21.76	23.71	19.81
T ₂	26.99	15.89	21.44	23.00	19.88
T ₃	26.90	18.13	22.52	26.49	18.55
T ₄	24.61	12.80	18.71	23.31	14.10
Mean	25.90	16.31	21.11	24.13	18.09
H ₁	28.80	19.45	24.13		
H ₂	23.00	13.17	18.09		

S.E. of marginal mean of T = 1.08 ton/ac.
 S.E. of marginal mean of V or H = 0.76 ton/ac.
 S.E. of body of table V×H = 1.08 ton/ac.
 S.E. of body of tables V×T and H×T = 1.53 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 48(36).

Site :- Distt. and Demonstration Farm, Ambala.

Type :- 'CM'.

Object :—To study the effect of N and cultural practices on Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Hard clay loam. (b) N.A. (iii) 16,17.2.1948. (iv) (a) As per treatments. (b) N.A. (c) 40,000 setts/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 21.59%. (x) 24.3.1949.

2. TREATMENTS :

Main-plot treatments :

2-cultural practices : C₁=Ploughing once by *raja* and 4 times by *desi hal* and 2 hoeings and C₂=Ploughing once by *raja*, 7 times by *desi hal* and 4 hoeings.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : N₁=50 and N₂=100 lb./ac.(2) 2 types of mulch : M₁=Soil mulch and M₂=Artificial mulch.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 64'×17'. (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Sugarcane and *gur* yield. (iv) (a) 1947 to 1948. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.99 ton/ac.
 (ii) (a) 4.33 ton/ac.
 (b) 1.70 ton/ac.
 (iii) Only M effect is highly significant.

(iv) Av. yield of sugarcane in ton/ac.

	M ₁	M ₂	Mean	N ₁	N ₂
C ₁	12.16	16.27	14.21	13.95	14.47
C ₂	10.80	16.74	13.77	13.61	13.93
Méan	11.48	16.50	13.99	13.78	14.20
N ₁	10.80	16.76	13.78		
N ₂	12.15	16.25	14.20		

S.E. of difference of two

1. C marginal means =1.53 ton/ac.
2. M or N marginal means =0.61 ton/ac.
3. sub-plot treatment means at the same level of main-plot treatment =0.85 ton/ac.
4. main-plot treatment means at the same level of sub-plot treatment =1.65 ton/ac.
5. S.E. of body of M×N table =0.60 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49(76).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CM'.

Object :- To study the effect of spacing and manures on yield of *gur*.

4. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 15.3.1949. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.70°. (x) 15.2.1950 to 22.2.1950.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of N : N₀=0 and N₁=70 lb./ac. of N as A/S.
- (2) 3 spacings : S₁=1', S₂=2' and S₃=3' between rows.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) N.A. (iii) Yield of *gur*. (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4.25 ton/ac.
- (ii) 0.41 ton/ac.
- (iii) None of the effects is significant.
- (iv) Av. yield of *gur* in ton/ac.

	S ₁	S ₂	S ₃	Mean
N ₀	4.20	4.29	3.96	4.15
N ₁	4.21	4.43	4.41	4.35
Mean	4.20	4.36	4.19	4.25

- S.E. of marginal mean of N =0.10 ton/ac.
 S.E. of marginal mean of S =0.12 ton/ac.
 S.E. of body of table =0.17 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50 (88).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CM'.

Object :- To study the effect of spacing and manures on yield of sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 27.2.1950. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 tying up and 1 ridging. (ix) 16.61". (x) 22.1.1951 to 24.1.1951, 27.1.1951 to 3.2.1951 and 10.2.1951 to 16.2.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N : $N_0=0$ and $N_1=70$ lb./ac. of N as A/S.(2) 3 spacings : $S_1=1'$, $S_2=2'$ and $S_3=3'$ between rows.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) No. (iii) Yield of gur. (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 3.48 ton/ac.

(ii) 0.43 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of gur in ton/ac.

	S_1	S_2	S_3	Mean
N_0	3.46	3.46	3.17	3.36
N_1	3.52	3.68	3.60	3.60
Mean	3.49	3.57	3.39	3.48

S.E. of marginal mean of N = 0.11 ton/ac.

S.E. of marginal mean of S = 0.14 ton/ac.

S.E. of body of table = 0.19 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 48(31).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'CM'.

Object :- To study the effect of spacing, manuring and interculturalures on Sugarcane yield.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Fallow. (for two out of the four replications). (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (d) 2' and 3' apart. (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) Hoeings. (ix) 26.44". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 spacings : S_1 =Planting in rows 2' apart and S_2 =Planting in rows 3' apart.(2) 2 levels of N as A/S : $N_1=100$ and $N_2=200$ lb./ac.(3) 4 post sowing operations : H_1 =Hoeing by bullocks only, H_2 =Hoeing by bullocks and by hand, H_3 =Hoeing by hand only and H_4 =Weeding only.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Cane counts and sugarcane yield. (iv) (a) 1948—1949, (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 31.67 ton/ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av. yield of sugarcane in ton/ac.

	S ₁	S ₂	Mean	N ₁	N ₂
H ₁	31.74	30.18	30.96	30.22	31.70
H ₂	31.66	30.18	30.92	30.75	31.09
H ₃	33.50	33.58	33.54	31.73	35.34
H ₄	32.45	30.02	31.24	29.85	32.64
Mean	32.34	30.99	31.67	30.64	32.69
N ₁	32.64	28.64	30.64		
N ₂	32.04	33.34	32.69		

Crop :- Sugarcane.

Ref :- Pb. 49(61).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'CM'.

Object :- To study the effect of spacing, manuring and interculture on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 18.67". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 2 spacings : S₁=Planting in rows 2' apart. and S₂=Planting in rows 3' apart.
 (2) 2 levels of N as A/S : N₁=100 and N₂=200 lb./ac.
 (3) 4 post-sowing operations : H₁=Hoeing by bullocks only, H₂=Hoeing by bullocks and by hand,
 H₃=Hoeing by hand only and H₄=Weeding only.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Cane counts and sugarcane yield. (iv) (a) 1948-1949. (b) No. (c) Nil.
 (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 38.19 ton/ac.
 (ii) N.A.
 (iii) N.A.

(iv) Av. yield of sugarcane in ton/ac.

	S ₁	S ₂	Mean	N ₁	N ₂
H ₁	37.56	36.11	36.84	35.95	37.72
H ₂	36.96	37.91	37.44	37.19	37.68
H ₃	40.98	38.56	39.77	39.95	39.59
H ₄	40.22	37.18	38.70	39.05	38.36
Mean	38.93	37.44	38.19	38.04	38.34
N ₁	38.77	37.30	38.04		
N ₂	39.10	37.58	38.34		

Crop :- Sugarcane.

Ref :- Pb. 48(27).

Site :- Sugarcane Res. Stn., Jullundur

Type :- 'T'.

Object :- To find the best time of irrigation for Sugarcane crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 26.44". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 2 pre-monsoon irrigations : A₁=10 days and A₂=15 days interval.(2) 2 irrigations-during monsoon : B₁=10 days and B₂=15 days interval.(3) 2 post-monsoon irrigations : C₁=10 days and C₂=15 days interval.

3. DESIGN :

(i) 2³ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) 1946 to 1948. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.43 ton/ac.

(ii) N.A.

(iii) N.A.

(iv) Av. yield of sugarcane in ton/ac

	A ₁	A ₂	Mean	B ₁	B ₂
C ₁	27.31	20.63	23.97	23.66	24.28
C ₂	25.37	20.39	22.88	22.37	23.38
Mean	26.34	20.51	23.43	23.02	23.83
B ₁	25.48	20.55	23.02		
B ₂	27.20	20.46	23.83		

Crop :- Sugarcane.

Ref :- Pb. 51(43).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'IV'.

Object :--To study the effect of hot weather and post-monsoon irrigation intervals on growth and yield of some important Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif-fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 1.4.1951. (iv) (a) 1 tractor, 2 *hindustan hal*, 5 *desi hal*, and 7 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) 2' row to row. (e) N.A. (v) 8.5 md/ac. of G.N.C. applied on 31.3.1951. (vi) As per treatments. (vii) Irrigated. (viii) 100 lb./ac. of A/S applied on 13.6.1951 and 150 lb./ac. on 29.6.1951 (ix) 17.98°. (x) 20,21.5.1952.

2. TREATMENTS :

Main-plot treatments :

6 times of Irrigation : I₁=pre 7th day and post 15th day. I₂=pre 7th day and post 30th day. I₃=pre 14th day and post 15th day, I₄=pre 14th day and post 30th day, I₅=pre 21st day and post 15th day and I₆=pre 21st day and post 30th day.

Sub-plot treatments :

6 varieties : V₁=CO. 312 (medium), V₂=CO.L. 9 (medium), V₃=CO.K. 30 (medium), V₄=CO. 617 (late). V₅=CO.L. 29 (early) and V₆=CO. 453 (late).

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10'×61'. (b) 10'×58.08'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and stand fair. No lodging. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 160.7 ton/ac.

(ii) (a) 4.49 ton/ac.

(b) 2.41 ton/ac.

(iii) Main-plot and sub-plot treatments are highly significantly different. Interaction is not significant.

(iv) Av. yield of stripped cane in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean
I ₁	16.30	19.35	18.67	23.44	12.26	21.97	18.67
I ₂	12.90	15.75	15.02	26.20	14.97	18.87	17.29
I ₃	16.46	15.13	15.55	21.81	12.58	19.95	16.91
I ₄	15.80	15.80	13.59	20.55	11.98	18.99	16.12
I ₅	15.36	11.85	12.86	18.96	11.46	15.38	14.31
I ₆	12.47	10.38	12.65	16.32	10.45	16.51	13.13
Mean	14.88	14.71	14.72	21.21	12.28	18.61	16.07

S.E. of difference of two

- | | |
|-----------------------------------|---------------|
| 1. I marginal means | =1.50 ton/ac. |
| 2. V marginal means | =0.82 ton/ac. |
| 3. I means at the same level of V | =2.37 ton/ac. |
| 4. V means at the same level of I | =2.01 ton/ac. |

Crop :- Sugarcane.

Ref :- Pb. 52 (119).

Site :- Sugarcane Res. Stn., Jullundur

Type :- 'IV'.

Object : - To study the effect of hot weather and post-monsoon irrigation intervals on the growth and yield of some important Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 25, 26.3.1952. (iv) (a) 1 tractor, 5 *desi hal* and 8 *sohaga*. (b) N.A. (c) 40,000 setts. (d) 2' row to row. (e) N.A. (v) 16 trucks of F.Y.M. applied on 12.3.1952. (vi) As under treatments. (vii) Irrigated. (viii) 50 lb./ac. of N as A/S applied on 3.6.1952. (ix) 36.61". (x) 3.2.1953.

2. TREATMENTS :

Main-plot treatments :

Intervals of Irrigations :

All combinations of (1) and (2)

(1) 3 pre-monsoon irrigations : $M_1=7$, $M_2=14$ and $M_3=21$ days interval.(2) 2 post-monsoon irrigations : $N_1=15$ and $N_2=30$ days interval.

Sub-plot treatments :

6 varieties : $V_1=CO.312$, $V_2=CO.L. 9$, $V_3=CO.K. 30$ (late), $V_4=CO.L. 617$ (early), $V_5=CO.L. 29$ (late) and $V_6=CO.453$ (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10' x 61'. (b) 10' x 54½' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Cane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 16.96 ton/ac.

(ii) (a) 13.21 ton/ac.

(b) 2.48 ton/ac.

(iii) Sub-plot treatment effect is highly significant, while all others are not significant.

(iv) Av. yield of stripped cane in ton/ac.

	V_1	V_2	V_3	V_4	V_5	V_6	Mean	N_1	N_2
M_1	11.72	16.49	15.71	19.21	23.09	18.14	17.39	17.74	17.05
M_2	13.43	17.02	16.75	21.80	22.96	18.89	18.48	17.82	19.13
M_3	10.02	14.47	14.03	18.17	18.91	14.42	15.00	18.61	11.51
Mean	11.72	15.99	15.50	19.73	21.65	17.15	16.96	18.06	15.86
N_1	12.32	16.38	16.11	21.71	23.58	18.25	18.06		
N_2	11.13	15.61	14.89	17.74	19.73	16.05	15.86		

S.E. of difference of two

1. marginal means of M = 3.11 ton/ac.
2. marginal means of N = 2.55 ton/ac.
3. marginal means of V = 0.82 ton/ac.
4. means in the body of M x N table = 4.40 ton/ac.
5. V means at the same level of M = 1.43 ton/ac.
6. V means at the same level of N = 1.17 ton/ac.
7. M means at the same level of V = 3.38 ton/ac.
8. N means at the same level of V = 2.76 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53 (140).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'IV'.

Object:—To study the effect of hot weather and post-monsoon irrigation intervals on the growth and yield of some important Sugarcane varieties.

1. BASAL CONDITIONS :

(i) (a) Wheat-kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 9, 10.4.1953. (iv) (a) to (e) N.A. (v) Ten trucks of compost. Date N.A. (vi) As under treatments. (vii) Irrigated. (viii) N.A. (ix) 32.8". (x) 27.4.1954.

2. TREATMENTS :

Main-plot treatments :

Intervals of irrigation.

All combinations of (1) and (2)

(1) 3 pre-monsoon irrigations : $M_1=7$, $M_2=14$ and $M_3=21$ days interval.(2) 2 post-monsoon irrigations : $N_1=15$ days and $N_2=30$ days interval.

Sub-plot treatments :

6. varieties : $V_1=CO.312$, $V_2=CO.L. 9$ $V_3=CO.K. 30$ $V_4=CO.617$, $V_5=CO.L. 29$ and $V_6=CO. 453$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12'×47'. (b) 12'×42'-1". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory except for CO.L.9. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 20.01 ton/ac.

(ii) (a) 1.69 ton/ac.

(b) 3.64 ton/ac.

(iii) Overall main-plot effect, M effect and $M \times N$ interaction are highly significant ; N effect and varieties effect are significant. All others are not significant.

(iv) Av. yield of stripped cane in ton/ac.

	V_1	V_2	V_3	V_4	V_5	V_6	Mean	N_1	N_2
M_1	22.23	16.34	22.75	22.63	20.63	21.37	20.99	22.38	19.60
M_2	21.47	18.24	20.37	20.30	19.88	17.90	19.69	19.54	19.85
M_3	21.58	17.51	19.18	20.04	17.98	19.81	19.35	19.36	19.33
Mean	21.76	17.36	20.77	20.99	19.50	19.69	20.01	20.43	19.60
N_1	20.90	18.68	20.75	21.15	20.37	20.73	20.43		
N_2	22.63	16.05	20.78	20.83	18.63	18.66	19.60		

S.E. of difference of two

- | | |
|--|---------------|
| 1. M marginal means | =0.40 ton/ac. |
| 2. N marginal means | =0.33 ton/ac. |
| 3. V marginal means | =1.22 ton/ac. |
| 4. means in the body of $M \times N$ table | =0.56 ton/ac. |
| 5. V means at the same level of M | =2.10 ton/ac. |
| 6. V means at the same level of N | =1.72 ton/ac. |
| 7. M means at the same level of V | =1.96 ton/ac. |
| 8. N means at the same level of V | =1.60 ton/ac. |

Crop :- Sugarcane.

Ref :- Pb. 48(3)

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'IM'.

Object :- To study the effect of irrigation and A/S on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 9.4.1948. (iv) (a) 1 *raja*, 5 *desi* plough and 5 *sohaga*. (b) N.A. (c) 25,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 3 hoeings, 1 ridging and 1 tying up. (ix) 27.27". (x) 3.12.1948, 28.12.1948 and 7.1.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of total irrigation : $I_1=40''$, $I_2=60''$ and $I_3=80''$.

(2) 3 levels of N as A/S : $N_0=0$, $N_1=75$ lb./ac. and $N_2=150$ lb./ac.

A/S applied in three equal doses on 9.4.1948, 22.5.1948 and 24.6.1948 respectively.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (v)₁(a) 14'×109'. (b) 10'×96'-10". (v)† N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. (ii) Nil. (iii) *Gur* and stripped cane yield. (iv) (a) to (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 19.45 ton/ac.

(ii) 3.56 ton/ac.

(iii) N effect is highly significant while others are not significant.

(iv) Av. yield of stripped cane in ton/ac.

	N_0	N_1	N_2	Mean
I_1	12.51	19.73	22.20	18.15
I_2	14.13	22.06	25.04	20.41
I_3	16.42	20.13	22.88	19.81
Mean	14.35	20.64	23.37	19.45

S.E. of marginal mean any = 1.03 ton/ac.

S.E. of body of table = 1.78 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49(52).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 7.3.1949. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 40,000 setts/ac. (d) and (e) N.A. (v) 30 C.L. of F.Y.M. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78". (x) 5 to 9.1.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of total irrigation : $I_1=40''$, $I_2=60''$ and $I_3=80''$.

(2) 3 levels of N as A/S : $N_0=0$, $N_1=75$ and $N_2=150$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 12'×109'. (b) 12'×90½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) N.A. (iii) Stripped cane yield. (iv) (a) 1949—1951. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 35.84 ton/ac.
 (ii) 2.958 ton/ac.
 (iii) Main effect of I is highly significant, main effect of N is significant while interaction is not significant.
 (iv) Av. yield of stripped cane in ton/ac.

	N ₀	N ₁	N ₂	Mean
I ₁	34.17	34.11	31.92	33.40
I ₂	31.51	38.33	34.63	34.82
I ₃	37.97	41.34	38.59	39.30
Mean	34.55	37.93	35.05	35.84

S.E. of any marginal mean = 0.854 ton/ac.
 S.E. of body of table = 1.479 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 50(57).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 4.3.1950. (iv) (a) 5 ploughings and 7 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) 22-C.L./ac. of F.Y.M. (vi) CO.312 (medium). (vii) Irrigated. (viii) 1 earthing up, 1 tying up and 3 hoeings. (ix) 55.35%. (x) 11.12.1950 to 30.12.1950.

2. TREATMENTS :

All combination of (1) and (2)

(1) 3 levels of total irrigation : I₁=40", I₂=60" and I₃=80".

(2) 3 levels of N as A/S : N₀=0, N₁=75 and N₂=150 lb./ac.

Half dose of N applied on 22.5.1950 while the other half applied on 12.6.1950.

1. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 71'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 30.60 ton/ac.
 (ii) 1.466 ton/ac.
 (iii) Main effects of I and N are highly significant while interaction is not significant.

(iv) Av. yield of stripped cane in ton/ac.

	N ₀	N ₁	N ₂	Mean
I ₁	23.88	29.78	29.46	27.71
I ₂	28.89	32.47	34.15	31.84
I ₃	27.39	35.43	33.93	32.25
Mean	26.72	32.56	32.51	30.60

S.E. of marginal means of I or N = 0.423 ton/ac.
 S.E. of body of table = 0.733 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(107).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 2.3.1951. (iv) (a) 6 ploughings and 5 *sohaga*. (b) to (e) N.A. (v) 44 C.L./ac. of F.Y.M. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 25.67". (x) 13 to 15.3.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of total irrigation : I₁=40", I₂=60" and I₃=80".(2) 3 levels of N as A/S : N₀=0, N₁=75 and N₂=150 lb./ac.

A/S applied on 21.5.1951 and 3.7.1951.

3. DESIGN :

(i) 3×3 Factor in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 16'×72'. (b) 1/40. ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good. No Lodging. (ii) Nil. (iii) Stripped cane yield. (iv) (a) 1949-1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.89 ton/ac.

(ii) 2.539 ton/ac.

(iii) Main effect of N is highly significant. Others are not significant.

(iv) Av. yield of stripped cane in ton/ac.

	N ₀	N ₁	N ₂	Mean
I ₁	23.36	28.75	30.91	27.67
I ₂	21.92	29.18	34.84	28.65
I ₃	23.68	33.18	34.16	30.34
Mean	22.99	30.37	33.30	28.89

S.E. of any marginal mean = 0.733 ton/ac.
 S.E. of body of table = 1.269 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(46).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'TM'.

Object :- To study the effect of application of manure on yield of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Cotton. (c) Nil (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) (a) 12.4.1951. (iv) (a) 10 *desi* plough and 12 *sohaga*. (b) N.A. (c) 40,000 sett/ac. (d) 2' row to row. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 13.12.1951.

2. TREATMENTS :

Main-plot treatments :

2 times of irrigation : I_1 = Irrigation before sowing and I_2 = Irrigation after sowing.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 sources of N : N_0 = Control (no manure), N_1 = A/S at 100 lb./ac. of N N_2 = G.N.C. at 100 lb./ac of N and N_3 = *Mohwa* cake at 100 lb./ac. of N(2) 2 methods of application of N : M_1 = Broadcast and M_2 = In furrows.G.N.C., *Mohwa* cake and half of A/S applied at sowing time *i.e.* 12.4.1951. Other half of A/S applied on 27.6.1951.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12' x 50'. (b) 12' x 48'-5". (v) 1'-7" left across the rows only. (vi) Yes.

4. GENERAL :

- (i) Germination fair, growth stunted. Below average crop. No lodging. (ii) Fairly high incidence of top borer. (iii) Germination, tillering, linear growth, G.L. number, juice analysis, no. of matured setts and yield of sugarcane (iv) (a) 1951-1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 12.27 ton/ac.
 (ii) (a) 0.343 ton/ac.
 (b) 3.276 ton/ac.
 (iii) Main-plot treatments are highly significant, sub-plot treatments are significant while their interaction is not significant.
 (iv) Av. yield of sugarcane in ton/ac.

	I_1	I_2	Mean	M_1	M_2
N_0	12.58	8.08	10.33	—	—
N_1	16.44	11.77	14.11	14.36	13.86
N_2	14.44	13.39	13.92	12.78	15.04
N_3	10.84	10.59	10.72	9.35	12.08
Mean	13.57	10.96	12.27	12.16	13.66
M_1	12.30	10.52	11.41		
M_2	14.85	11.40	13.12		

S.E. of difference of two

1. I marginal means = 0.099 ton/ac.
 2. N marginal means = 1.338 ton/ac.
 3. M marginal means in $I \times M$ table = 0.946 ton/ac.
 4. M marginal means in $N \times M$ table = 1.092 ton/ac.
 5. N means at the same level of I = 1.891 ton/ac.
 6. I means at the same level of N = 1.641 ton/ac.
 7. M means at the same level of I = 1.337 ton/ac.
 8. I means at the same level of M = 0.951 ton/ac.
 9. means in body of $N \times M$ table = 1.891 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(120).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'IM'.

Object :—To study the effect of certain organic and inorganic manures when applied under varying soil moisture levels and methods of application on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 29.3.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 2 hoeings and 2 earthing up. (ix) 36.61". (x) 10.1.1953.

2. TREATMENTS :

Main-plot treatments :

2 times of irrigation : I_1 = Irrigation before sowing and I_2 = Irrigation after sowing.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of application of N : M_1 = Broadcast and M_2 = In furrows.

(2) 4 sources of N : N_0 = Control, N_1 = A/S at 100 lb./ac. of N, N_2 = G.N.C. at 100 lb./ac. of N and N_3 = Mohwa cake at 100 lb./ac. of N.

All I_1 plots were ploughed up because of poor germination and hence the expt. analysed as ordinary R.B.D. (Fact.) with the sub-plot treatments only.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 12' x 50'. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (iii) Stripped cane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 24.52 ton/ac.
 (ii) 2.101 ton/ac.
 (iii) "Control vs. others" effect is highly significant while other effects are not significant.
 (iv) Av. yield of stripped cane in ton/ac.

	M_1	M_2	Mean
N_0	—	—	20.87
N_1	25.81	26.28	26.05
N_2	25.47	24.83	25.15
N_3	26.08	25.91	26.00
Mean	25.79	25.67	24.52

S.E. of marginal mean of M = 0.70 ton/ac.

S.E. of marginal mean of N = 0.86 ton/ac.

S.E. of body of table = 1.21 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(138).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'IM'.

Object :—To study the effect of certain organic and inorganic manures when applied under varying soil moisture levels and methods of application on the germination, growth and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 28.2.1953. (iv) (a) 4 *dest hal* and 1 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 2 hoeings and 7 to 8 ridgings. (ix) 32.8". (x) 14.1.1954.

2. TREATMENTS :

Main-plot treatments :

2 times of irrigation : I_1 =Irrigation before sowing and I_2 =Irrigation after sowing.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of application of manure : M_1 =Broadcast and M_2 =In furrows.

(2) 4 sources of N : N_0 =Control, N_1 =A/S at 100 lb./ac. of N, N_2 =G.N.C. at 100 lb./ac. of N and N_3 =Mohwa Cake at 100 lb./ac. of N.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12'×47'
(b) 1/85 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Stripped sugarcane yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil.
(v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 31.35 ton/ac.
(ii) (a) 9.82 ton/ac.
(b) 2.76 ton/ac.
(iii) Main-plot effects are not significant. Overall sub-plot treatments are highly significant and N effect is also highly significantly different. $I \times N$ is significant while all other effects are not significant.
(iv) Av. yield of sugarcane in ton/ac.

	N_0	N_1	N_2	M_3	Mean	M_1	M_2
I_1	25.01	40.23	34.57	29.94	32.43	32.85	32.02
I_2	24.42	33.87	34.83	27.95	30.26	30.05	30.48
Mean	24.71	37.05	34.70	28.94	31.35	31.45	31.25
M_1	23.96	36.96	35.70	29.18	31.45		
M_2	25.46	37.13	33.70	28.70	31.25		

S.E. of difference of two

1. I marginal means =2.84 ton/ac.
2. M marginal means =0.79 ton/ac.
3. N marginal means =1.13 ton/ac.
4. M means at the same level of I =1.13 ton/ac.
5. I means at the same level of M =2.94 ton/ac.
6. N means at the same level of I =1.59 ton/ac.
7. I means at the same level of N =3.15 ton/ac.
8. means of $M \times N$ table =1.59 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Sub-Stn., Gurdaspur.

Ref :- Pb. 52(51).

Type :- 'IMV'.

Object :- To study the effect of irrigation and manure on yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Kharif fodder-Sugarcane. (b) Fodder. (c) No. (ii) (a) Loamy. (b) N.A. (iii) 27.3.1952 and 28.3.1952. (iv) (a) 2 hindustan plough, 6 desi and 6 sohaga. (b) to (e) N.A. (v) 15 C.L. of F.Y.M. by broadcast. (vi) As per treatments. (vii) Irrigated. (viii) One bar harrow, one hoeing with cultural *Kasuala*, one ridging and tying. (ix) 28.50". (x) 2.1.1953 to 15.1.1953.

2. TREATMENTS :

Main plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as F.Y.M. and A/S : $N_0=0$, $N_1=100$ and $N_2=200$ lb./ac.(2) 2 intensities of irrigation : I_1 =Restricted (15—18 days interval) and I_2 =Liberal(10—12 days interval).

Sub-plot treatments :

4 varieties : V_1 =CO. 312 (late), V_2 =CO. K. 30 (medium), V_3 =CO. L. 9 (medium) and V_4 =CO. L. 29 (early).

F.Y.M. is applied at planting and A/S on 3.6.1952 by broadcast in equal doses.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12' x 72'. (b) 12' x 60'-6". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination of CO. K. 30 and CO. L. 29 is good while that of CO. L. 9 is fair. Stand of CO. K. 30, CO. 312 and CO. L. 29 is good and that of CO. L. 9 is poor to fair. No lodging. (ii) Pyrrilla attack. Dusted with BHC powder. (iii) Stripped sugarcane yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 21.76 ton/ac.

(ii) (a) 3.449 ton/ac.

(b) 3.053 ton/ac.

(iii) V and N effects are highly significant. I effect and interaction $I \times M$ are not significant.

(iv) Av. yield of stripped sugarcane in ton/ac.

	V_1	V_2	V_3	V_4	Mean	I_1	I_2
N_0	23.51	20.24	12.15	15.72	17.90	18.23	17.58
N_1	27.37	25.48	16.63	19.13	22.15	21.80	22.50
N_2	30.18	27.56	19.23	23.97	25.23	24.34	26.12
Mean	27.02	24.43	16.00	19.61	21.76	22.46	21.07
I_1	26.77	24.48	15.40	19.20	21.46		
I_2	27.27	24.37	16.61	20.02	22.07		

S.E. of difference of two

1. N marginal means	=0.86 ton/ac.
2. I marginal means	=0.70 ton/ac.
3. V marginal means	=0.88 ton/ac.
4. V means at the same level of N	=1.53 ton/ac.
5. N means at the same level of V	=1.58 ton/ac.
6. V means at the same level of I	=2.45 ton/ac.
7. I means at the same level of V	=1.29 ton/ac.
8. means in body of $N \times I$ table	=1.22 ton/ac.

Crop :- Sugarcane.

Site :- Sugarcane Sub-Stn., Gurdaspur.

Ref :- Pb. 53(83).

Type :- 'IMV'.

Object :- To study the effect of irrigation and manure on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 19.3.1953. (iv) (a) 1 *hindustan* plough-10 *desi hal* and 13 *sohaga*. (b) N.A. (c) 35000 setts/ac. (d) 2' x 2'. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 bar harrow, 5 hoeings, 1 ridging and tying up. (ix) 34.46". (x) 30.12.1953 to 16.1.1954.

2. TREATMENTS :

Main-plot treatments :

All combination of (1) and (2).

(1) 3 levels of N as F.Y.M. and A/S : $N_0=0$, $N_1=100$ and $N_2=200$ lb /ac.

(2) 2 intensities of irrigation : $I_1=$ Restricted (15—18 days interval) and $I_2=$ Liberal (10—12 days interval).

Sub-plot treatments :

4 varieties : $V_1=$ CO. 312 (late), $V_2=$ CO.K. 30 (medium), $V_3=$ CO.L. 9 (medium) and $V_4=$ CO.L.29 (early).

Half dose of N as F.Y.M. applied at planting on 19.3.1953 and the other half dose applied as A/S in two equal doses on 2.6.1953 and 23.6.1953.

As tube well got out of order, irrigation could not be followed as planned. For $I_1=4$ irrigations were given while for $I_2=5$ irrigations were given.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'×72'. (b) 12'×60'. (v) 6' border rows kept along breadth side. (vi) Yes.

4. GENERAL :

(i) In $N_1 I_2$ plots germination of CO.312, CO.K. 30 is good while satisfactory for CO.L. 29 and poor for others. In $N_1 I_1$ plots germination of [CO.312, CO.K.30, CO.L. 29 is normal and of CO.L. 9 is poor. No lodging. (ii) Nil. (iii) Growth, tillering, yield of stripped cane. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 22.41 ton/ac.

(ii) (a) 5.415 ton/ac.

(b) 2,200 ton/ac.

(iii) N and I effects and interactions $N \times I$, $V \times I$ are not significant. V effect is highly significant while $I \times N$ is significant.

(iv) Av. yield of stripped cane in ton/ac.

	V_1	V_2	V_3	V_4	Mean	I_1	I_2
N_0	26.66	22.88	11.67	21.52	20.68	22.11	19.26
N_1	30.68	26.25	12.05	24.52	23.38	22.75	24.01
N_2	30.86	26.02	11.89	23.86	23.16	23.33	22.99
Mean	29.40	25.05	11.87	23.30	22.41	22.73	22.09
I_1	29.91	25.86	11.95	23.20	22.73		
I_2	28.89	24.24	11.79	23.41	22.08		

S.E. of difference of two

1. N marginal means = 1.35 ton/ac.
2. I marginal means = 0.82 ton/ac.
3. V marginal means = 0.63 ton/ac.
4. V means as the same level of N = 1.10 ton/ac.
5. N means at the same level of V = 1.65 ton/ac.
6. V means as the same level of I = 0.90 ton/ac.
7. I means at the same level of V = 1.35 ton/ac.
8. means of the table $M \times I$ = 0.78 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(99).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'IMV'.

Object :- To study the effect of irrigation and manure on yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. Hansi. (iii) 15.3.1952. (iv) (a) 8 *desi* plough, 6 *sohaga* and 2 roller. (b) N.A. (c) 100 md/ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings. (ix) 14.94". (x) 3.5,6 to 18.2.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2).

(1) 3 levels of manure : M_0 =no manure, M_1 =100 lb./ac. of N as A/S and M_2 =200 lb./ac. of N as A/S and F.Y.M.(2) 2 levels of irrigation : I_1 =normal irrigation. I_2 =2 extra irrigation than I_1 .

Sub-plot treatments :

(3) 3 varieties : V_1 =CO.K. 30, V_2 =CO.-312 (late) and V_3 =CO.L-9 (early).

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 3 sub-plots/main-plot. (v) N.A. (iii) 4. (iv) (a) and (b) 60.5'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Gur* yield. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3.99 ton/ac.
 (ii) (a) 0.76 ton/ac.
 (b) 0.48 ton/ac.
 (iii) Only V effect is highly significant. No other effect is significant.
 (iv) Av. yield of *gur* in ton/ac.

	I_1	I_2	Mean	V_1	V_2	V_3
M_0	3.71	3.83	3.77	4.10	3.78	3.43
M_1	3.91	3.88	3.90	3.94	4.16	3.58
M_2	4.36	4.23	4.30	4.57	4.23	4.09
Mean	3.99	3.98	3.99	4.20	4.06	3.70
V_1	4.21	4.19	4.20			
V_2	4.01	4.10	4.06			
V_3	3.75	3.65	3.70			

S.E. of difference of two

- | | |
|-----------------------------------|---------------|
| 1. M marginal means | =0.21 ton/ac. |
| 2. I marginal means | =0.18 ton/ac. |
| 3. V marginal means | =0.14 ton/ac. |
| 4. means in the body of M×I table | =0.31 ton/ac. |
| 5. V means at the same level of M | =0.38 ton/ac. |
| 6. M means at the same level of V | =0.39 ton/ac. |
| 7. V means at the same level of I | =0.24 ton/ac. |
| 8. I means at the same level of V | =0.19 ton/ac. |

Crop :- Sugarcane.
Site :- Govt. Agri. Stn., Hansi,

Ref :- Pb. 53(117).

Type :- 'IMV'.

Object :—To study the effect of irrigation and manure on yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 9.3.1953. (iv) (a) 1 *raja* plough, 10 *desi* plough, 20 *sohaga*, 2 roller and 1 disc harrow. (b) N.A. (c) 100 md./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 blind hoeing, 2 hoeings and 5 tyings. (ix) 12.76". (x) 23 to 27.12.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of manure : M_0 =No manure, M_1 =100 lb./ac. of N as A/S and F.Y.M. and M_2 =200 lb./ac. of N as A/S and F.Y.M.

(2) 2 levels of irrigations : I_1 =Normal irrigation and I_2 =Two extra irrigations than I_1 .

Sub-plot treatments :

3 varieties : V_1 =CO-312 (late), V_2 =CO.L-9 (early) and V_3 =CO.K. 30 (late).

F.Y.M. applied on 23.5.1953 by broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 60.5'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. In plots of 200 lb./ac. of N there was lodging of the crop. No lodging else where. (ii) Nil. (iii) *Gur* yield. (iv) (a) 1952 to 1956. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 5.60 ton/ac.

(ii) (a) 0.32 ton/ac.

(b) 0.49 ton/ac.

(iii) Main-plot treatments are not significantly different. Varieties are highly significantly different. No interaction is significant.

(iv) Av. yield of *gur* in ton/ac.

	I_1	I_2	Mean	V_1	V_2	V_3
M_0	5.64	5.45	5.55	5.97	4.68	6.01
M_1	5.67	5.62	5.65	5.48	4.69	6.77
M_2	5.61	5.56	5.59	5.36	5.08	6.32
Mean	5.64	5.55	5.60	5.60	4.82	6.37
V_1	5.76	5.45	5.60			
V_2	4.81	4.82	4.82			
V_3	6.36	6.37	6.37			

S.E. of difference of two

- | | |
|--|---------------|
| 1. M marginal means | =0.10 ton/ac. |
| 2. I marginal means | =0.08 ton/ac. |
| 3. V marginal means | =0.16 ton/ac. |
| 4. means in the body of $M \times I$ table | =0.16 ton/ac. |
| 5. V means at the same level of M | =0.28 ton/ac. |
| 6. M means at the same level of V | =0.25 ton/ac. |
| 7. V means at the same level of I | =0.23 ton/ac. |
| 8. I means at the same level of V | =0.21 ton/ac. |

Crop :- Sugarcane.

Ref :- Pb. 48(26).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'IMV'.

Object :—To study the effect of manures and irrigations on the yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A.
 (iv) (a) to (e) N.A. (v) Nil. (vi) As under treatments. (vii) Irrigated. (viii) N.A. (ix) 26.44".
 (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : N_0 =No manure (control), N_1 =100 lb./ac. of N and N_2 =200 lb./ac. of N.(2) 3 levels of irrigation : I_1 =5% soil moisture level, I_2 =10% soil moisture level and I_3 =15% soil moisture level.(3) 3 varieties V_1 =CO. 312, V_2 =CO.L. 22 and V_3 =CO.L. 9.

3. DESIGN :

(i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Severe attack of pyrilla. (iii) Cane counts and cane yield. (iv) (a) 1948 to 1950.
 (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 28.96 ton/ac.

(ii) N.A.

(iii) N.A.

(iv) Av. yield of sugarcane in ton/ac.

	V_1	V_2	V_3	Mean	N_0	N_1	N_2
I_1	31.46	22.74	25.21	26.47	23.45	27.94	28.02
I_2	33.78	26.15	26.63	28.85	27.50	29.99	29.07
I_3	36.91	27.72	30.02	31.55	29.53	32.55	32.56
Mean	34.05	25.53	27.29	28.96	26.83	30.16	29.88
N_0	31.83	23.45	25.21	26.83			
N_1	36.64	26.62	27.22	30.16			
N_2	33.68	26.53	29.43	29.88			

S.E.s are not available.

Crop :- Sugarcane.

Ref :- Pb. 49 (58).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'IMV'.

Object :—To study the effect of manures and irrigations on the yield of different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer [soil analysis, Jullundur. (iii) N.A.
 (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 18.67". (x) N.A.

1. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1 =Co. 312, V_2 =CO.L. 22 and V_3 =CO.L. 9.

(2) 3 levels of N as A/N : N_0 =No manure (control), N_1 =100 lb./ac. of N and N_2 =200 lb./ac. of N.

(3) 3 levels of irrigation : I_1 =5% soil moisture level, I_2 =8% soil moisture level and I_3 =11% soil moisture level.

3. DESIGN :

(i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) N.A. (iv) (a), (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Cane counts and cane yield. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 30.77 ton/ac.

(ii) N.A.

(iii) N.A.

(iv) Av. yield of sugarcane in ton/ac.

	N_0	N_1	N_2	Mean	V_1	V_2	V_3
I_1	27.05	30.91	29.79	29.25	36.31	18.62	32.81
I_2	29.37	33.37	31.35	31.36	37.02	21.30	35.77
I_3	28.48	32.05	34.59	31.71	38.93	20.95	35.24
Mean	28.30	32.11	31.91	30.77	37.42	20.29	34.61
V_1	34.27	39.16	38.84	37.42			
V_2	17.98	22.22	20.67	20.29			
V_3	32.65	34.94	36.22	34.61			

S.Es. are not available.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 50 (63).

Type :- 'IMV'.

Object :- To study the effect of irrigations and manures on different varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 50.12". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 varieties : V_1 =CO.312, V_2 =CO.L. 9 and V_3 =CO.L. 22.

(2) 3 levels of N : N_0 =No manure (control), N_1 =100 lb./ac. of N and N_2 =200 lb./ac. of N.

(3) 3 levels of irrigation : I_1 =5% soil moisture level, I_2 =8% soil moisture level and I_3 =11% soil moisture level.

3. DESIGN :

(i) 3³ Fact. R.B.D. (ii) (a) 27. (b) N.A. (iii) N.A. (iv) (a), (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Cane counts and cane yield. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.28 ton/ac.
 (ii) N.A.
 (iii) N.A.
 (iv) Av. yield of sugarcane in ton/ac.

	V ₁	V ₂	V ₃	Mean	N ₀	N ₁	N ₂
I ₁	19.51	12.55	15.04	15.70	14.27	15.87	16.97
I ₂	22.50	13.79	17.14	17.81	16.59	17.54	19.31
I ₃	22.86	15.30	16.87	18.34	17.62	18.69	18.72
Mean	21.62	13.88	16.35	17.28	16.16	17.36	18.33
N ₀	20.59	12.86	15.03	16.16			
N ₁	21.27	14.32	16.50	17.36			
N ₂	23.01	14.46	17.53	18.33			

S.Es. are not available.

Crop :- Sugarcane.

Site :- Sugarcane Res. Stn., Jullundur.

Ref :- Pb. 49(59).

Type :- 'CIM'.

Object :- To study the effect of irrigation, manure and spacing on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) N.A. (ix) 18.67". (x) N.A.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of irrigation. I₁=5% soil moisture, I₂=8% soil moisture and I₃=11% soil moisture.

(2) 3 levels of N as A/N: N₀=No manure, N₁=100 lb./ac. of N and N₂=200 lb./ac. of N.

(3) 2 spacings: S₁=Planting 2' apart and S₂=Planting 3' apart.

3. DESIGN :

(i) 3×3×2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Sugarcane yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 28.77 ton/ac.
 (ii) N.A.
 (iii) N.A.

(iv) Av. yield of sugarcane in ton/ac.

	S ₁	S ₂	Mean	N ₀	N ₁	N ₂
I ₁	24.24	23.88	24.06	22.16	24.77	25.26
I ₂	31.14	29.24	30.19	25.68	31.20	33.69
I ₃	33.80	30.34	32.07	29.16	33.17	33.88
Mean	29.73	27.82	28.77	25.67	29.71	30.94
N ₀	26.54	24.80	25.67			
N ₁	30.70	28.73	29.71			
N ₂	31.94	29.94	30.94			

Standard errors are not available.

Crop :-Sugarcane.

Site :-Agri. Stn., Karnal.

Ref :-Pb. 48(33).

Type :-'CIM'.

Object :-To study the effect of irrigation and manure under different cultural practices.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) N.A. (iv) (a) As per treatments. (b) and (c) N.A. (d) Row to row 2'. (e) N.A. (v) 10 C.L. of F.Y.M. Date N.A. (vi) CO.312 (medium). (vii) Irrigated. (viii) N.A. (ix) 30.48'. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

2 levels of ploughing : C₁=1 *raja* and 15 *desi* ploughings, and C₂=1 *raja* and 22 *desi* ploughings.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of irrigations : I₁=16 irrigations and I₂=24 irrigations.(2) 2 levels of manure : M₁=100 lb./ac. of N and M₂=150 lb./ac. of N.

N applied as mixture of A/S and Ammo. Phos. mixed in the ratio 3 : 2.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 14'×80'. (b) 1/38.89 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Sugarcane and *gur* yield. (v) (a) 1946 to 1948. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Originally the experiment was conducted with 4 replications but yield data was available for only 2 replications and hence data was analysed accordingly.

5. RESULTS :

(i) 2.32 ton/ac.

(ii) (a) 0.21 ton/ac.

(b) 0.23 ton/ac.

(iii) None of the effects is significant.

(iv) Av. yield of *gur* in ton/ac.

	M ₁	M ₂	Mean	I ₁	I ₂
C ₁	2.24	2.28	2.26	2.14	2.37
C ₂	2.58	2.19	2.38	2.50	2.27
Mean	2.41	2.23	2.32	2.32	2.32
I ₁	2.30	2.34	2.32		
I ₂	2.52	2.12	2.32		

S.E. of difference of two

1. C marginal means = 0.10 ton/ac.
2. I or M marginal means = 0.11 ton/ac.
3. I or M means at the same level of C = 0.15 ton/ac.
4. C means as the same level of I or M = 0.15 ton/ac.
5. means in body of I × M table = 0.23 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 49(54).

Site :- Sugarcane Sub-Stn., Gurdaspur.

Type :- 'D'.

Object :—To find the best pre-planting treatment of setts.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 24.3.1949. (iv) (a) 6 ploughings and 6 *sohaga*. (b) to (e) N.A. (v) 44 C.L./ac. of F.Y.M. (vi) CO.K. 30 (medium). (vii) Irrigated. (viii) N.A. (ix) 27.78". (x) 14.1.1950

2. TREATMENTS :

1. Setts soaked in water for 24 hrs. before planting.
2. Setts soaked in water for 12 hrs. before planting.
3. Setts soaked in water for 6 hrs. before planting.
4. Freshly cut setts planted.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 16' × 75.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 30.42 ton/ac.
- (ii) 0.366 ton/ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of stripped cane in ton/ac.

Treatment	Av. yield
1.	29.03
2.	30.70
3.	31.53
4.	30.43
S.E./mean	= 0.259 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(44).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To study the effect of Fernoxone (Hormone 2, 4) on germination, growth and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Berseem*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 7.4.1951. (iv) (a) 2 *hindustan hal*, 5 *desi hal* and 5 *sohaga*. (b) N.A. (c) 100 sett/plot. (d) 2' row to row. (e) N.A. (v) Nil. (vi) CO.L. 9 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 10.5.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(3) 3 durations of soaking : $D_1=24$ hrs., $D_2=12$ hrs. and $D_3=6$ hrs.(2) Fernoxone per million parts of water : $F_1=40$ parts, $F_2=20$ parts and $F_3=10$ parts.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination patchy ; growth below normal. No lodging. (ii) Nil. (iii) Yield of stripped cane. (iv) (a) Contd. (b)—. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 6.90 ton/ac.
 (ii) 3.96 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of stripped cane in ton/ac.

	D ₁	D ₂	D ₃	Mean
F ₁	5.33	3.31	3.78	4.14
F ₂	7.39	9.66	9.32	8.79
F ₃	6.72	4.73	11.85	7.77
Mean	6.48	5.90	8.32	6.90

S.E. of marginal mean of F or D
 S.E. of body of table

=1.32 ton/ac.
 =2.28 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51 (47).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To study the effect of 'Gromore', a harmonic product, on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sann*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 25.4.1951. (iv) (a) and (b) N.A. (c) 40,000 sett/ac. (d) and (e) N.A. (v) Nil. (vi) CO. 313 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 24.12.1951.

2. TREATMENTS :

1. Fresh cane planted in soil manured with *gromore* 1 : 80.
2. Fresh cane planted in soil manured with *gromore* 1 : 40.
3. Cane soaked in *gromore* 1 : 4 and planted in soil manured with *gromore* 1 : 80.
4. Cane soaked in *gromore* 1 : 4 and planted in soil manured with *gromore* 1 : 40.
5. Fresh cane planted in ordinary soil manured with 100 lb./ac. of N in A/S in the end of June and mid July. In treatment 5 half of A/S applied on 27.6.1951 and the other half on 13.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 10'×50'. (b) 10'×45'-5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 5.90 ton/ac.
 (ii) 1.80 ton/ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	4.48
2.	3.80
3.	9.23
4.	7.41
5.	4.57
S.E./mean	=1.04 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51 (49).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To study the effect of certain harmonic substances on the germination and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20.4.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) CO.L. 9 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.98". (x) 14.12.1951 ; 22.12.1951.

2. TREATMENTS :

1. Fresh cane.
2. Fresh cane soaked in water for 24 hours.
3. Fresh cane soaked in water for 48 hours.
4. Fresh cane soaked in sanitary solution 1 : 10 for an hour.
5. Fresh cane soaked in sanitary solution 1 : 20 for an hour.
6. Fresh cane soaked in sanitary solution 1 : 40 for an hour.
7. Fresh cane soaked in *gromore* 1 : 8 for one hour.
8. Fresh cane soaked in *agrosan* 1% (1 : 100) for 24 hour.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) and (b) 8'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Yield of stripped cane. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 8.59 ton/ac.
 (ii) 2.11 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of stripped cane in ton/ac.

Treatment	Av. yield
1.	6.25
2.	8.40
3.	9.31
4.	8.96
5.	9.17
6.	8.61
7.	7.50
8.	10.49
S.E./mean	= 1.22 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 51(50).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To find out the effect of insecticides against top borer on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 9.4.1951. (iv) (a) 5 ploughings and 3 *sohaga*. (b) to (e) N.A. (v) 10 trucks of compost applied on 23.2.1951 mixed with soil by ploughing. (vi) CO. L. 9 (medium). (vii) Irrigated. (viii) 5 hoeings and once earthing up. (ix) 17 98". (x) 30.4.1952 to 1.5.1952.

2. TREATMENTS :

1. DDT (W.P.) 0.3%.
2. Agro (W.P.) 0.3%.
3. Liquid Agro 0.25%.
4. Ovicide 1%.
5. DDT dust.
6. BHC dust.
7. Spike thrust.
8. Earthing up.
9. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Top borer attack. As per treatments. (iii) Top borer incidence and yield data of stripped sugarcane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.23 ton/ac.
- (ii) 3.94 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of stripped sugarcane in ton/ac.

Treatment	Av. yield
1.	20.26
2.	14.40
3.	17.16
4.	13.10
5.	18.26
6.	14.14
7.	18.62
8.	20.00
9.	19.12
SE /mean	= 2.78 ton/ac.

Crop :- Sugarcane.

Ref :- . Pb. 51(51).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To find out the effect of insecticides against top borer attack on yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 9.4.1951. (iv) (a) 5 ploughings and 3 *sohaga*. (b) to (e) N.A. (v) 10 trucks load of compost on 23.2.1951 which was mixed with soil by ploughing. CO.312 (medium) (vii) Irrigated. (viii) 5 hoeings and once earthing up. (x) 17.98". (x) 30.4.1952 to 1.5.1952.

2. TREATMENTS :

1. DDT (W.P.) 0.3%.
2. Agro (W.P.) 0.3%.
3. Liquid agro 0.25%.
4. Ovicide 1.0%.
5. DDT dust.
6. BHC dust.
7. Spike thrust.
8. Earthing up.
9. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Top borer attack. As per treatments. (iii) Top borer incidence and yield data. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 10.12 ton/ac.
- (ii) 1.09 ton/ac.
- (iii) Treatments are significantly different.
- (iv) Av. y eld of sugarcane in ton/ac.

Treatment	Av. yield
1.	10.74
2.	9.73
3.	11.74
4.	10.14
5.	12.14
6.	11.52
7.	7.93
8.	9.28
9.	7.90
S.E./mean	=0.77 ton/ac.

Crop :-Sugarcane.

Ref :-Pb. 51(52).

Site :-Sugarcane Res. Stn., Jullundur.

Type :-'D'.

Object :-To find out the effect of control measures to check white ant attack on Sugarcane yield.

1. BASAL CONDITIONS :

(i) (a) Wheat—Fallow—Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) -0,31.3.1951. (iv) (a) 5 ploughings and 3 *sohaga*. (b) and (c) N.A. (d) 2' row to row. (e) N.A. (v) 6 truck load of city compost applied on 14.3.1951 mixed with soil by ploughing. (vi) CO.312 (medium). (vii) Irrigated. (viii) 3 hoeings and once earthing up. (ix) 17.98". (x) 14,15.12.1951.

2. TREATMENTS :

1. Guesarol 550 1%.
2. BHC. Agro (W.P.) 1%.
3. Corrosive Sublimate 0,25%.
4. Lead arsenate DO. 25.
5. Gram dust at 36 lb./ac.
6. Hexyclan at 36 lb./ac.
7. DDT. dust at 36 lb./ac.
8. Contro'.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) White ant attack. As per treatments. (iii) Germination and stripped cane yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS

- (i) 16.96 ton/ac.
 (ii) 2.27 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of stripped cane in ton/ac.

Treatment	Av. yield
1.	17.31
2.	14.97
3.	15.65
4.	17.46
5.	16.30
6.	18.50
7.	18.64
8.	16.88
S.E./mean	= 1.14 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(127).

Site :- Sugarcane. Res. Stn., Jullundur.

Type :- 'D'.

Object :- To find out effective and economic control measures to check white ant attack on Sugarcane and its effects on yield.

1. BASAL CONDITIONS :

(i) (a) Wheat—*Kharif* fodder—Sugarcane. (b) *Kharif* fodder (*Cheri*). (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 11.10.1952. (iv) 1 *hindustan* plough, 2 *desi hal* and 3 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO.312 (medium). (vii) Irrigated. (viii) 1 blind hoeing, 3 hoeings and once earthing up. (ix) 36.61". (x) 18.12.1953 and 11.1.1954.

2. TREATMENTS

- | | |
|---------------------------------|--------------------------------------|
| 1. 1 % DDT. (Guesarol 550). | 9. 1.0 % Lead arsenate. |
| 2. 0.5 % DDT. (Guesarol 550). | 10. 0.25% Corrosive Sublimate. |
| 3. 0.25% D.D.T. (Guesarol 550). | 11. 0.1 % Corrosive Sublimate. |
| 4. 0.5 % BHC. (Agro W.P.). | 12. 5.0 % Hexidole dust (light). |
| 5. 0.25% BHC. (Agro W.P.). | 13. 5.0 % BHC. dust (gam. DO. 25). |
| 6. 0.1 % BHC. (Agro W.P.). | 14. 7.0 % BHC. dust (gam. DO. 25). |
| 7. 5.0 % Lead arsenate. | 15. 10.0 % BHC. dust (Hexyclan 10%). |
| 8. 2.5 % Lead arsenate. | 16. Control. |

3. DESIGN :

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) and (b) 12'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) White ant attack. Control measures as per treatments. (iii) Germination and Sugarcane yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) No. (vi) Nil. (vii) Originally experiment was laid out with 4 replications but yield in respect of one replication was not recorded so it was treated as with 2 replications only.

5. RESULTS :

- (i) 24.13 ton/ac.
 (ii) 5.06 ton/ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	26.25	9.	22.83
2.	20.19	10.	20.74
3.	23.57	11.	20.65
4.	26.53	12.	27.53
5.	26.53	13.	26.25
6.	25.42	14.	22.22
7.	28.98	15.	22.41
8.	25.65	16.	20.30
S.E./mean		= 2.92 ton/ac.	

Crop :- Sugarcane.

Ref :- Pb. 52(123).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To study the effect of fernoxone on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder.) (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur
 (iii) 15.4.1952. (iv) (a) 5 *desi hal* and 4 *sohaga*. (b) to (e) N.A. (v) 8 ton/ac. of F.Y.M. on 13.3.1952.
 (vi) CO.L.9 (medium). (vii) Irrigated. (viii) 2 hoeings and twice earthing up. (ix) 36.61". (x) 11.1.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 durations of soaking : $D_1=24$ hrs, $D_2=12$ hrs and $D_3=6$ hrs.(2) Fernoxone per million parts of water : F_0 =No Fernoxone (control), $F_1=40$ parts, $F_2=20$ parts, $F_3=10$ parts.

3. DESIGN :

(i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) $8' \times 24'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of stripped cane. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 17.52 ton/ac.

(ii) 3.90 ton/ac.

(iii) Only D effect is significant.

(iv) Av. yield of stripped cane in ton/ac.

	D_1	D_2	D_3	Mean
F_0	20.77	20.42	14.10	18.43
F_1	19.52	18.13	13.40	17.02
F_2	20.07	15.90	17.29	17.75
F_3	17.85	16.60	16.25	16.90
Mean	19.55	17.76	15.26	17.52

S.E. of marginal mean of F = 1.30 ton/ac.

S.E. of marginal mean of D = 1.13 ton/ac.

S.E. of body of table = 2.25 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(128).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To find out effective and economical measures against top borer and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) *Chari-Bajra-Fallow*—Sugarcane. (b) *Chari, bajra and fallow*. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 3.4.1952. (iv) (a) 3 ploughings and 2 *sohaga*. (b) to (e) N.A. (v) 11 trucks of city compost applied on 12.3.1952 by broadcast method and ploughed in. (vi) CO.L.9 (medium) (vii) Irrigated. (viii) 4 hoeings and once earthing up. (ix) 36.61°. (x) 6 to 14.12.1952.

2. TREATMENTS :

1. 0.5% DDT (Gues 550).
 2. 0.5% DDT (Em).
 3. 0.5% BHC (Agro W.P.)
 4. 0.25% Liquid Agro.
 5. 1.0% ovicide.
 6. 10% DDT dust at 20 lb./ac.
 7. Hexyclan 10% at 20 lb./ac.
 8. Control.
- Dates of spraying : 3.7.1952 and 16.8.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 16' x 70'. (b) 1/40 ac. (v) N.A. (vi) Yes

4. GENERAL :

(i) Very poor. (ii) Topborer incidence ; control measures as under treatments. (iii) Sugarcane yield data. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 5.96 ton/ac.
(ii) 1.78 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield
1.	6.21
2.	6.31
3.	6.24
4.	6.83
5.	5.47
6.	5.11
7.	6.16
8.	5.34
S.E./mean	=0.89 ton/ac

Crop :- Sugarcane.

Ref :- Pb. 52(126).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To find out effective and economical control measures to check white ant attack on Sugarcane crop and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari and guara*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 26, 27.3.1952. (iv) (a) 4 ploughings, 2 *sohaga* and 1 *karab*. (b) to (e) N.A. (v) 8 trucks of town refuse compost applied on 13.3.1952 mixed with soil by ploughing. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 4 hoeings and once earthing up. (ix) 36.61°. (x) 3 to 5.2.1953.

2. TREATMENTS :

1. 1.0% DDT (Gues 550).
2. 0.5% DDT (Gues 550).
3. 0.5% BHC (Agro W.P.).
4. 0.25% BHC (Agro W.P.).
5. 0.25% Corrosive sublimate.
6. Lead arsenate 5.0%.
7. Lead arsenate 2.5%.
8. BHC dust in furrows, after planting, at 35 lb./ac.
9. BHC dust applied to ends and whole setts.
10. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) and (b) 12'×103'. (v) No. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) White ant attack ; control measures as per treatments. (iii) Germination % and yield sugarcane data. (iv) (a) No. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.78 ton/ac.
 (ii) 1.50 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of cane in ton/ac.

Treatment	Av. yield
1.	20.63
2.	21.17
3.	19.22
4.	20.54
5.	18.53
6.	21.26
7.	20.17
8.	19.59
9.	19.43
10.	17.26
S.E./mean	=0.90 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(125).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object ;—To find out effective and economical control measures against stem borer and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 20.5.1952. (iv)-(a) 4 ploughings. (b) to (e) N.A. (v) 8 trucks/ac. of compost manure on 13.3.1952. (vi) CO.421 (late). (vii) Irrigated. (viii) 3 hoeings and one ridging. (ix) 36.61". (x) 4.1.1953

2. TREATMENTS :

1. 50 lb./ac. of BHC 5% dust.
2. 40 lb./ac. of BHC 5% dust.
3. 30 lb./ac. of BHC 5% dust.
4. Control.

Applied on 23.6.1952 as dust at the base of shoots.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 1/48.4 ac. (b) 1/50 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Attack of stem borer ; control measures as per treatments. (iii) Stripped cane yield. (iv) (a) Not contd. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 16.64 ton/ac.
(ii) 2.66 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of cane in ton/ac. :

Treatment	Av. yield
1.	18.04
2.	16.46
3.	16.86
4.	15.19
S.E./mean	= 1.33 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 52(122)

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :- To study the effect of *Gromore* on germination and yield of Sugarcane.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Kharif fodder-Fallow-Sugarcane. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 14.4.1952. (iv) (a) 1 *hindustan hal*, 4 *desi hal* and 6 *sohaga*. (b) N.A. (c) 35,000 setts/ac. (d) and (e) N.A. (v) 8 ton/ac. of F.Y.M. on 13.3.1952. (vi) CO. 312 (medium), (vii) Irrigated. (viii) N.A. (ix) 36.61". (x) 11.1.1953.

2. TREATMENTS :

- Fresh cane sown in soil manured with *Gromore* 1 : 80.
- Fresh cane sown in soil manured with *Gromore* 1 : 40.
- Setts soaked in *Gromore* 1 : 4 and sown in soil manured with *Gromore* 1 : 80.
- Setts soaked in *Gromore* 1 : 4 and sown in soil manured with *Gromore* 1 : 40.
- Fresh cane sown in soil manured with A/S at 100 lb./ac. of N in June (24.6.1952).
- Control (unsoaked fresh setts).

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) and (b) 8' x 24'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Yield of stripped cane. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 18.87 ton/ac.
(ii) 2.70 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of stripped cane in ton/ac.

Treatment	Av. yield
1.	17.71
2.	17.09
3.	20.63
4.	23.68
5.	17.02
6.	17.09
S.E./mean	=1.56 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(146).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To find effective and economical control measures against top borer and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Sann* for green manuring. (c) Green manuring with *sann*. Details N.A. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 27 and 28.3.1953. (iv) (a) 5 ploughings and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) One blind hoeing, one hand hoeing with *kasaula* and one *panjdante*. (ix) 32.8°. (x) 3 and 6.12.1952 and 27.1.1953.

2. TREATMENTS :

- | | |
|----------------------------|-------------------------|
| 1. 0.5% DDT (Eml). | 7. Chloradane 5% dust. |
| 2. 0.5% DDT (Gues 550). | 8. DDT 10% dust. |
| 3. 0.5% BHC (Agro W.P.). | 9. BHC 10% dust. |
| 4. 0.5% Chloradane (Eml). | 10. Toxaphene 10% dust. |
| 5. 0.5% Chloradane (W.P.). | 11. Parathion 10% dust. |
| 6. 0.5% Lindane (W.P.) | 12. Control. |

3. DESIGN :

(i) R B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Top borer incidence. Control measures as per treatments. (iii) Top borer incidence and sugarcane yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 21.90 ton/ac.
(ii) 1.70 ton/ac.
(iii) Treatments are significantly different.
(iv) Av. yield of sugarcane in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	24.10	7.	21.99
2.	24.10	8.	21.41
3.	22.48	9.	22.35
4.	20.48	10.	26.89
5.	21.40	11.	19.51
6.	17.54	12.	20.57

S.E /mean = 1.20 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53 (145).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To find effective and economical control measures against top bores and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* for green manuring. (c) Green manured with *guara*. Details N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 27 and 28.3.1953. (iv) (a) 5 ploughings and 3 *sohaga*. (b) to (e), N.A. (v) Nil. (vi) CO.L.9 (medium). (vii) Irrigated. (viii) One blind hoeing, one hand hoeing, one hoeing with *kasaula* and one *panjdante*. (ix) 32.8°. (x) 3, 6.12.1953 to 27.1.1954.

2. TREATMENTS :

- | | |
|----------------------------|-------------------------|
| 1. 0.5% DDT (Eml.) | 7. Chloradane 5% dust. |
| 2. 0.5% DDT (Gues 550). | 8. DDT 10% dust. |
| 3. 0.5% BHC (Agro W.P.). | 9. BHC 10% dust. |
| 4. 0.5% Chloradane (Eml.). | 10. Toxaphene 10% dust. |
| 5. 0.5% Chloradane (W.P.). | 11. Parathion 10% dust. |
| 6. 0.5% Lindane (W.P.). | 12. Control. |

Spraying on 20.5.1953, 3.7.1953, 31.7.1953 and 1.8.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 2. (iv) (a) and (b) 12'×90'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Top borer incidence ; control measures as per treatments. (iii) Top borer incidence and yield of cane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.80 ton/ac.
 (ii) 2.24 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of cane in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	15.08	7.	17.17
2.	17.61	8.	19.10
3.	20.19	9.	19.74
4.	15.41	10.	15.59
5.	17.63	11.	20.77
6.	17.45	12.	17.91
S.E./mean		= 1.58 ton/ac.	

Crop :- Sugarcane.

Ref :- Pb. 53 (144).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To find out the effective and economical control measures to check the white ant attack on Sugarcane and its effect on yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 17.3.1953.
 (iv) (a) 5 ploughings and 3 *sohaga*. (b) to (e) N.A. (v) 2 C.L. of F.Y.M. applied on 18, 20.2.1953 mixed with soil by ploughing. (vi) CO. 312 (medium). (vii) Irrigated. (viii) 5 hoeings and one earthing up.
 (ix) 32.8". (x) 5 to 9.1.1954.

2. TREATMENTS :

- | | |
|------------------------|-------------------------------|
| 1. 1.0% DDT. | 8. 0.5% Corrosive sublimate. |
| 2. 0.5% DDT. | 9. 0.25% Corrosive sublimate. |
| 3. 0.5% BHC. | 10. 5.0% Hexidole. |
| 4. 0.25% BHC. | 11. 5.0% BHC (Gues D 025). |
| 5. 0.1% BHC. | 12. 7.0% BHC (Gues D 027). |
| 6. 5.0% Lead arsenate. | 13. 1.0% BHC (Gues D 120). |
| 7. 2.5% Lead arsenate. | 14. Control. |

3. DESIGN :

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) and (b) 14'×50'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) White ant attack ; control measures as per treatments. (iii) Count on white ant attack and yield of sugarcane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 33.60 ton/ac.
 (ii) 4.58 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of cane in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	34.96	8.	33.38
2.	33.75	9.	31.58
3.	33.90	10.	27.35
4.	37.06	11.	33.38
5.	33.69	12.	33.92
6.	35.06	13.	32.52
7.	34.79	14.	35.02
S.E./mean		= 2.29 ton/ac.	

Crop :- Sugarcane.

Ref :- Pb. 53(126).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To find out effective and economical control measures to check white ant attack on Sugarcane crop and its effect on yield:

1. BASAL CONDITIONS :

(i) (a) Wheat-*Chari* fodder-Sugarcane. (b) *Chari* fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 30.9.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 312 (medium). (vii) Irrigated. (viii) Five hoeings and one earthing up. (ix) 32.8°. (x) 15 and 16.5.1954.

2. TREATMENTS :

- | | |
|-------------------------------------|---------------------------------------|
| 1. 1.0% DDT (Gues 550). | 8. 5.0% Chloradane dust at 40 lb./ac. |
| 2. 0.5% DDT (Gues 550). | 9. 5% BHC dust at 40 lb./ac. |
| 3. 0.5% BHC (Agro W.P.). | 10. 7% BHC dust at 40 lb./ac. |
| 4. 0.25% BHC (Agro W.P.). | 11. 10% BHC dust at 40 lb./ac. |
| 5. 0.5% Dieldrix. | 12. 10% Toxaphene dust at 40 lb./ac. |
| 6. 0.25% Dieldrix. | 13. Control. |
| 7. 5.0% Hexidole dust at 40 lb./ac. | |
- Treatments applied at planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 10'×24'. (b) 8'×24'. (v) One foot from each side of length left out. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) White ant attack ; control measures as per treatments. (iii) % white ant attack to buds and yield of stripped cane. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 34.20 ton/ac.
 (ii) 1.54 ton/ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield sugarcane in ton/ac.

Treatment	Av. yield	Treatment	Av. yield
1.	38.08	8.	36.84
2.	26.59	9.	39.68
3.	33.07	10.	32.61
4.	34.06	11.	29.50
5.	41.02	12.	35.25
6.	41.91	13.	24.06
7.	31.96		

S.E./mean = 0.77 ton/ac.

Crop :- Sugarcane.

Ref :- Pb. 53(143).

Site :- Sugarcane Res. Stn., Jullundur.

Type :- 'D'.

Object :—To find out effective and economical control measures to check attack of sugarcane stem borer.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sugarcane. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 5.3.1953. (iv) (a) to (e) N.A. (v) 8 C.L. of F.Y.M. Date N.A. (vi) CO. 421 (medium). (vii) Irrigated. (viii) One blind hoeing and three hoeings with *panjdante*. Ridging on 5.8.1953. (ix) 32.80°. (x) 30.4.1954.

2. TREATMENTS :

Main-plot treatments :

I₁=Single application in April, I₂=Two applications in April and May and

I₃=Three applications in April, May and June.

Sub-plot treatments :

T₁=15 lb./ac. of actual BHC, T₂=2.0 lb./ac. of actual BHC,

T₃=2.5 lb./ac. of actual BHC and T₄=Control.

Application done on I=14.4.1953, II=16.5.1953 and III=13.6.1953.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 1/54.45th ac. (b) 1/60th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Attacked by stem borer. (iii) Incidence of stem borer after each application of BHC and yield of sugarcane. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 26.24 ton/ac.
 (ii) (a) 2.89 ton/ac.
 (b) 1.65 ton/ac.
 (iii) Main-plot as well as sub-plot treatments are not significantly different while interaction main-plots \times sub-plots is highly significant.
 (iv) Av. yield of sugarcane in ton/ac.

	T ₁	T ₂	T ₃	T ₄	Mean
I ₁	27.02	25.21	24.84	26.12	25.80
I ₂	25.10	29.42	25.19	27.18	26.72
I ₃	24.96	26.57	28.62	24.66	26.20
Mean	25.69	27.07	26.22	25.99	26.24

S.E. of difference of two

1. I marginal means = 1.19 ton/ac.
2. T marginal means = 0.78 ton/ac.
3. T means at the same level of I = 1.35 ton/ac.
4. I means at the same level of T = 1.66 ton/ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., Abohar.

Ref :- Pb. 52(161).

Type :- 'M'.

Object :- To study the effects of G.N.C. and A/S on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 3.6.1952. (iv) (a) to (c) N.A. (d) 2½' \times 1½'. (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) 2 gap fillings, 3 hoeings and 2 thinnings. (ix) 5.45'. (x) 4 pickings from 3.11.1952 to 20.12.1952.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 sources of N : S₁=A/S, S₂=G.N.C. and S₃=A/S and G.N.C. in ratio of 1 : 1.
- (2) 3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.

3. DESIGN :

(i) 3 \times 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 12.5' \times 61.25'. (b) 7.5' \times 53.75'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Boll weight, height, initiation of buds and kapas yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1816 lb./ac.
- (ii) 225.0 lb./ac.
- (iii) Control vs others effect is highly significant while other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean
S ₁	—	1906	2105	2006
S ₂	—	1836	2012	1924
S ₃	—	1894	1852	1873
Mean	1579	1879	1990	

S.E. of marginal mean of S = 64.9 lb./ac.
 S.E. of marginal mean of N = 53.0 lb./ac.
 S.E. of body of table = 91.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(162).

Site :- Cotton Res. Stn., Abohar.

Type :- 'M'.

Object :—To find out the best time and method of application of A/S for Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.6.1952. (iv) (a) to (c) N.A. (d) 2½' × 1¼'. (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) 1 gapfilling, 5 hoeings and one thinning on 11.25 and 29.7.1952. (ix) 5.45". (x) 4 pickings from 7.11.1952 to 24.12.1952.

2. TREATMENTS :

50 lb./ac. of N as A/S applied as :

All combinations of (1) and (2)

(1) 3 methods of placement : M₁=Broadcast in the whole plot, M₂=Surface application along rows and M₃=Drilled on one side of the row ; 2" on the side and 2" deep.

(2) 4 times of application : T₀=No manure, T₁=Early (with first irrigation), T₂=Late (at the outset of flowering) and T₃=Half early and half late.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 60' × 15'. (b) 50' × 10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, initiation of buds, boll weight and *kapas* yield. (iv) (a) 1952-contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1729 lb./ac.

(ii) 254.8 lb./ac.

(iii) Control vs others effect is highly significant. Other effects are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	T ₀	T ₁	T ₂	T ₃	Mean
M ₁	—	1830	1885	1801	1800
M ₂	—	1659	1658	1876	1638
M ₃	—	1784	1721	1880	1750
Mean	1552	1758	1755	1852	

S.E. of any marginal mean = 52.0 lb./ac.
 S.E. of body of table = 90.1 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(246).

Site :- Cotton Res. Stn., Abohar.

Type :- 'M'.

Object :- To find out the best time and method of application of A/S for Cotton.

1. BASAL CONDITIONS :

(i) (a) No. (b) Japan Rape. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 1.5.1953. (iv) (a) to (c) N.A. (d) 2' x 1½'. (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) One gap filling. (ix) 7.87". (x) Mid. November 1953.

2. TREATMENTS :

50 lb./ac. of N as A/S applied as :

All combinations of (1) and (2)

(1) 3 methods of placement: M_1 =Broadcast in the whole plot, M_2 =Surface application along rows and M_3 =Drilled on one side of the row; 2" on the side and 2" deep.

(2) 4 times of application: T_0 =No manure, T_1 =Early (with first irrigation), T_2 =Late (at the outset of flowering) and T_3 =Half early+half late.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50' x 10' (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Boll weight, initiation of buds and kapas yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 786.6 lb./ac.

(ii) 144.2 lb./ac.

(iii) Control vs other treatments effect is highly significant while others are not significant.

(iv) Av. yield of kapas in lb./ac.

	T_0	T_1	T_2	T_3	Mean
M_1	—	817.7	831.7	873.7	841.0
M_2	—	775.7	1055.7	809.3	880.2
M_3	—	873.7	1051.5	805.1	910.1
Mean	515.3	822.4	979.6	877.1	

S.E. of any marginal mean
S.E. of body of table

=41.6 lb./ac.
=72.1 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(244).

Site :- Cotton Res. Stn., Abohar.

Type :- 'M'.

Object :- To find the effect of graded doses of N, with special reference to its application, and P_2O_5 on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 25.5.1953. (iv) (a) to (c) N.A. (d) 2' x 1½'. (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) 1 thinning. (ix) 7.87". (x) 3 pickings from 26.10.1953 to 29.11.1953.

2. TREATMENTS:

Main-plot treatments :

All combinations of (1) and (2)

(1) 6 levels of N: $N_0=0$, $N_1=25$, $N_2=50$, $N_3=75$, $N_4=100$ and $N_5=125$ lb./ac.

(2) 3 times of application: T_1 =half at sowing+half at initiation of flowering, T_2 =half at last thinning +½ at initiation of flowering and T_3 =full dose at flowering.

Sub-plot treatments :

2 levels of P_2O_5 : $P_0=0$, $P_1=50$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 14'×45'. (b) 10'×40'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Initiation of buds, boll weight and kapas yield. (iv) (a) Not contd. (b) No. (c)—. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1318 lb./ac.
 (ii) (a) 300.1 lb./ac.
 (b) 143.3 lb./ac.
 (iii) N effect is highly significant. Other effects and interactions are not significant.
 (iv) Av. yield of kapas in lb /ac.

	P ₀	P ₁	Mean	T ₁	T ₂	T ₃
N ₀	936	931	934	—	—	—
N ₁	1200	1190	1195	1184	1114	1287
N ₂	1266	1296	1281	1260	1360	1223
N ₃	1509	1475	1492	1465	1559	1452
N ₄	1486	1453	1470	1594	1566	1250
N _r	1509	1565	1537	1608	1631	1372
Mean	1318	1318	1318	1422	1446	1317
T ₁	1340	1356	1348			
T ₂	1371	1353	1362			
T ₃	1240	1246	1244			

S.E. of difference of two

marginal means of N	= 86.7 lb./ac.
marginal means of T in P×T ₁ table	= 61.2 lb./ac.
marginal means of T in N×T table	= 67.1 lb./ac.
marginal means of P	= 23.9 lb./ac.
means in body of the table N×T	= 150.0 lb./ac.
P means at the same level of N	= 58.5 lb./ac.
P means at the same level of T	= 41.4 lb./ac.
N means at the same level of P	= 96.0 lb./ac.
T means at the same level of P	= 67.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(245).

Site :- Cotton Res. Stn., Abohar.

Type :- 'M'.

Object :- To study the effect of F.Y.M. and qualitative and quantitative effects of different nitrogenous fertilisers on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 13.5.1953. (iv) (a) to (c) N.A. (d) 2'×½'. (e) N.A. (v) N.A. (vi) F-320. (vii) Irrigated. (viii) Gap filling and 1 hoeing. (ix) 7.87". (x) End of Oct. and 30.11.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of F.Y.M. : $F_0=0$, $F_1=100$ and $F_2=200$ md./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 sources of N : $S_1=A/S$, $S_2=G.N.C.$ and $S_3=A/S$ and G.N.C. in ratio 1 : 1.(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $10' \times 50'$. (b) $6' \times 44'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Boll weight, height, [initiation of buds and *kapas* yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 543.4 lb./ac.
 (ii) (a) 116.1 lb./ac.
 (b) 74.9 lb./ac.
 (iii) Main effects of S and N are highly significant while other effects and interactions are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	F_0	F_1	F_2	Mean	N_0	N_1	N_2	Mean
S_1	587.8	578.1	559.5	575.1	—	629.4	680.6	655.0
S_2	533.0	508.3	523.3	521.5	—	518.0	668.2	593.1
S_3	523.3	536.5	541.0	533.6	—	561.3	624.9	593.1
Mean	548.0	541.0	541.3	543.4	402.8	569.5	657.9	
N_0	417.2	376.6	414.6	402.8				
N_1	554.2	565.7	588.7	569.5				
N_2	672.7	680.6	620.5	657.9				

S.E. of difference of two

- F marginal means = 27.4 lb./ac.
- S marginal means in $F \times S$ table = 17.7 lb./ac.
- S marginal means in $S \times N$ table = 21.6 lb./ac.
- N marginal means = 17.7 lb./ac.
- S or N means at the same level of F = 30.6 lb./ac.
- F means at the same level of S or N = 37.0 lb./ac.
- means in body $S \times N$ table = 30.6 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(249).

Site :- Cotton Res. Stn., Abohar.

Type :- 'M'.

Object :- To study the effect of P_2O_5 application in combination with N applied to previous crop on succeeding crop of Cotton.

1. BASAL CONDITIONS :

- (i) (a) No. (b) and (c) As per treatments. (ii) (a) Sandy loam. (b) N.A. (iii) 14.5.1953. (iv) (a) to (c) N.A. (d) $2' \times 1\frac{1}{2}'$. (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) 1 gap filling and 1 hoeing. (ix) 7.87". (x) 13.11.1953 and 30.11.1953.

2. TREATMENTS :

Main-plot treatments :

Previous crops : R_1 =Guara, R_2 =Gram, R_3 =Berseem, R_4 =Wheat and R_5 =Fallow.

Sub-plot treatments :

2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

Sub-sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb /ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) $45' \times 16'$. (b) $40' \times 12'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Initiation of buds, boll weight and *kapas* yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 910 lb./ac.
 (ii) (a) 246.2 lb./ac.
 (b) 196.4 lb./ac.
 (c) 130.5 lb./ac.
 (iii) Main effect of N and interaction $R \times N$ are highly significant. Others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	R_1	R_2	R_3	R_4	R_5	Mean	N_0	N_1	N_2
P_0	952	901	875	926	915	914	771	888	1083
P_1	926	810	918	843	1030	905	714	922	1080
Mean	939	856	896	884	972	910	742	905	1081
N_0	792	585	683	732	919	742			
N_1	968	878	894	830	955	905			
N_2	1056	1104	1113	1091	1043	1081			

S E. of difference of two

1. R marginal means = 71.1 lb./ac.
2. P marginal means = 35.9 lb./ac.
3. N marginal means = 29.2 lb./ac.
4. P means at the same level of R = 80.2 lb./ac.
5. R means at the same level of P = 90.9 lb./ac.
6. N means at the same level of R = 65.3 lb./ac.
7. R means at the same level of N = 88.8 lb./ac.
8. N means at the same level of P = 41.3 lb./ac.
9. P means at the same level of N = 49.2 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(3).

Site :- Cotton Res. Stn., Hansi.

Type :- 'M'.

Object :—To study the effect of graded doses of N with special reference to its time of application and in combination with P_2O_5 .

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 23.4.1953. (iv) (a) 4 *desi* ploughings, 3 *sohaga* and levelling. (b) Dibbling. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56%. (x) 4 pickings from 10.11.1953 to 8.1.1954.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 6 levels of N: $N_0=0$, $N_1=25$, $N_2=50$, $N_3=75$, $N_4=100$ and $N_5=125$ lb./ac.(2) 3 times of application of N: T_1 =Half at sowing+half at initiations of flowering, T_2 =Half at thinning+half at initiations of flowering and T_3 =Full dose at initiations of flowering.

Sub-plot treatments :

2 levels of P_2O_5 as Super: $P_0=0$ and $P_1=50$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $8' \times 46'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Height and *kapas* yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1186 lb./ac.

(ii) (a) 2860 lb./ac.

(b) 128.6 lb./ac.

(iii) Main effect of N and interaction $P \times T$ are highly significant. Main effect of T is significant. Others are not significant.(iv) Av. yield of *kapas* in lb./ac.

	T_1	T_2	T_3	Mean	P_0	P_1
N_0	—	—	—	741	707	776
N_1	936	1059	929	975	992	957
N_2	1192	1108	1033	1111	1102	1120
N_3	1493	1278	1333	1368	1407	1329
N_4	1515	1430	1359	1435	1458	1411
N_5	1788	1448	1227	1488	1446	1529
Mean	1385	1265	1176	1186	1185	1187
P_0	1314	1167	1074	1185		
P_1	1228	1171	1163	1187		
Mean	1271	1169	1119	1186		

S.E. of difference of two

1. N marginal means = 82.6 lb./ac.
2. T marginal means in $N \times T$ table = 63.9 lb./ac.
3. T marginal means in $T \times P$ table = 58.4 lb./ac.
4. P marginal means = 21.4 lb./ac.
5. P means at the same level of N = 52.5 lb./ac.
6. N means at the same level of P = 90.5 lb./ac.
7. P means at the same level of T = 37.1 lb./ac.
8. T means at the same level of P = 64.0 lb./ac.
9. means in body of $N \times T$ table = 143.0 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(5).

Site :- Cotton Res. Stn., Hansi.

Type :- 'M'.

Object :- To find an organic substitute for A/S.

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 30.4.1952. (iv) (a) 4 *desi* plough. (b) Dibbling by hand. (c) 10 sr./ac. (d) $2' \times 2'$. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 hoeings, 1 thinning and 2 weedings. (ix) 12.37%. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 sources of N : $S_1=A/S$, $S_2=G.N.C.$ and $S_3=A/S+G.N.C.$ in ratio 1 : 1.

Half A/S+half G.N.C. applied one month before sowing. Finely powdered $\frac{1}{2}$ groundnut cake externally distributed & thoroughly mixed up in soil just before the first irrigation after sowing. $\frac{1}{2}$ A/S applied around the plants at the outset of flowering followed by irrigation.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $10' \times 66'$. (b) $6' \times 60'$. (v) 2 rows and 3 feet left out on each side. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, boll no., pods/plant and *kapas* yield. (iv) (a) No. (b) (c)—. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1127 lb./ac.

(ii) 121.1 lb./ac.

(iii) All effects are highly significant.

(iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	Mean
N_0	—	—	—	1226
N_1	801	1069	1260	1043
N_2	827	1113	1392	1111
Mean	814	1091	1326	

S.E. of marginal mean of N

=28.5 lb./ac.

S.E. of marginal mean of S

=34.9 lb./ac.

S.E. of body of table

=49.4 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(5).

Site :- Cotton Res. Stn., Hansi.

Type :- 'M'.

Object :—To study the optimum date of application of A/S and its best mode of placement about the Cotton plant.

1. BASAL CONDITIONS :

(i) (a) Fallow-Cotton. (b) Fallow. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 24.4.1953. (iv) (a) 3 *desi* ploughs and 3 levelling with *sohaga*. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil (vi) F-216 (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56". (x) 4 pickings from 21.11.1953 to 8.1.1954.

2. TREATMENTS :

50 lb./ac. of N as A/S applied as :

All combinations of (1) and (2)+3 control plots.

(1) 3 methods of application : M_1 =Broadcast, M_2 =Surface application along rows and M_3 =Drilled on one side of row, 2" on the side and 2" deep.

(2) 3 times of application : T_1 =Early—with first irrigation, T_2 =Late—at the time of flowering and T_3 =Half early+half late.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $12' \times 44'$. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Height of the plant, no. of pods per plant and yield of *kapas*. (iv) (a) No. (b)—. (c)—. (v) (a) Jullundur and Abohar. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1145 lb./ac.
 (ii) 184.0 lb./ac.
 (iii) Control vs others effect is highly significant. All other effects and interaction are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Control=772 lb./ac.

	M ₁	M ₂	M ₃	Mean
T ₁	1264	1237	1254	1252
T ₂	1093	1361	1124	1193
T ₃	1330	1411	1344	1362
Mean	1229	1336	1241	1145

S.E. of any marginal mean =53.1 lb./ac.
 S.E. of body of table =92.0 lb./ac.

Crop :- Cotton.

Ref :- Pb. 48(49).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To find the best manurial formula for Cotton.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 25.4.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) M 60 A₂ (medium). (vii) Irrigated. (viii) One gap filling and 2 hoeings. (ix) 17.46". (x) 6 pickings from 17.9.1948 to 10.11.1948.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
 2. Ammo. Phos. at 50 lb./ac. of N.
 3. A/S at 100 lb./ac. of N.
 4. Ammo. Phos. at 100 lb./ac. of N.
 5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
 6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
 7. Control.
- F.Y.M. applied on 25.4.1948, Ammo. Phos. and A/S on 12.7.1948.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 11'×79'. (b) 10'×72.6'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1946 to 1948. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1493 lb./ac.
 (ii) 196.8 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1608
2.	1350
3.	1560
4.	1670
5.	1471
6.	1564
7.	1228
S.E./mean	=98.4 lb./ac.

Crop :- Cotton.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 50 (86).
Type :- 'M'.

Object :- To find the best manurial formula for Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.1.1950. (iv) (a) and (b) N.A. (c) 15 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 15.25". (x) 4 pickings from 28.9.1950 to 16.11.1950.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
2. Ammo. Phos. at 50 lb./ac. of N.
3. A/S at 100 lb./ac. of N.
4. Ammo. Phos. at 100 lb./ac.
5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
7. Control.

A/S and Ammo. Phos. were applied on 31.7.1950 at preflowering stage ; F.Y.M. applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 12'x74'. (b) 8'x68'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1950 to 1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1418 lb./ac.
(ii) 142.3 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1322
2.	1466
3.	1448
4.	1774
5.	1497
6.	1427
7.	995
S.E./mean	= 71.1 lb./ac.

Crop :- Cotton.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 51(24).
Type :- 'M'.

Object :- To find the best manurial formula for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* for fodder. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.4.1951. (iv) (a) 1 *raja* plough, 4 *desi* ploughs, 3 horse hoe, 7 *sohaga* and 1 roller. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 times gap filling, 3 hoeings and one thinning. (ix) 2.80". (x) 6 pickings from 20.9.1951 to 23.11.1951.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
2. Ammo. Phos. at 50 lb./ac. of N.
3. A/S at 100 lb./ac. of N.
4. Ammo. Phos. at 100 lb./ac. of N.
5. F.Y.M. at 50 lb./ac. of N.+A/S at 50 lb./ac. of N.
6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
7. Control.

F.Y.M. applied before sowing. Ammo. Phos. and A/S applied on 7.8.1951 at preflowering stage.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10'×80'. (b) 10'×80'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2048 lb./ac.
 (ii) 325.8 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	2027
2.	2093
3.	2156
4.	2405
5.	1985
6.	2048
7.	1621
S.E./mean	= 162.9 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 52(100).

Type :- 'M'.

Object : To find the best manurial formula for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 8.4.1952. (iv) (a) 8 *desi* plough, 3 *sohaga* and 2 roller. (b) N.A. (c) 12 sr. 2 chh./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (medium). (vii) Irrigated. (viii) One gap filling, 4 hoeings and one thinning. (ix) 14.66". (x) 4 pickings from 29.9.1952 to 20.11.1952.

2. TREATMENTS :

1. A/S at 50 lb./ac. of N.
2. Ammo. Phos. at 50 lb./ac. of N.
3. A/S at 100 lb./ac. of N.
4. Ammo. Phos. at 100 lb./ac. of N.
5. F.Y.M. at 50 lb./ac. of N+A/S at 50 lb./ac. of N.
6. F.Y.M. at 50 lb./ac. of N+Ammo. Phos. at 50 lb./ac. of N.
7. Control.

Ammo. Phos. and A/S applied on 8.8.1952 by broadcast. F.Y.M. applied by broadcast on 7.4.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 10'×80'. (b) 10'×72.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2547 lb./ac.
 (ii) 110.6 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	2567
2.	2494
3.	2847
4.	2810
5.	2550
6.	2665
7.	1898
S.E./mean	= 55.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(118).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To find the best manurial formula for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 29.4.1953. (iv) (a) 1 *raja*, 5 *desi* ploughs, 2 roller and 4 *sohaga*. (b) N.A. (c) 12 *sr* /ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling, 2 dibblings and 2 hoeings. (ix) 12.44". (x) 30.9.1953 to 24.11.1953.

2. TREATMENTS :

1. 50 lb./ac. of N as A/S.
2. 50 lb./ac. of N as Ammo. Phos.
3. 100 lb./ac. of N as A/S.
4. 100 lb./ac. of N as Ammo. Phos.
5. 50 lb./ac. of N as A/S + 50 lb./ac. of N as F.Y.M.
6. 50 lb./ac. of N as Ammo. Phos. + 50 lb./ac. of N as F.Y.M.
7. Control.

F.Y.M. applied on 18.5.1953 by broadcast. A/S and Ammo. Phos. applied on 28.7.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 94' × 10'. (b) 80'-8" × 10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good, stand poor. No lodging. (ii) *Kisari* attack. Dusted with gammaxene on 29.5.1953. (iii) *Kapas* yield. (iv) (a) 1950-53. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) In replication I except treatment 1 and 4, young cotton plants destroyed by *kisari* in their beds. Damage estimated 80%.

5. RESULTS :

- (i) 1176 lb./ac.
 (ii) 189.7 lb./ac.
 (iii) Treatment differences are significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1255
2.	1205
3.	1061
4.	1321
5.	1159
6.	1364
7.	866
S.E./mean	= 94.8 lb./ac.

Crop :- Cotton.

Ref :- Pb. 48(56).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To study the effect of T.C. and Farm compost on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 24.4.1948. (iv) (a) and (b) N.A. (c) 3 *chk.*/plot. (d) and (e) N.A. (v) Nil. (vi) M.60 A₂ (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 17.46". (x) 5 pickings from 18.9.1948 to 10.11.1948.

2. TREATMENTS :

1. T.C. at 10 ton/ac.
 2. Farm compost at 10 ton/ac.
 3. Control.
- Manures applied before sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 12' × 74'-4". (b) 12' × 60'-6". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948-50. (b) and (c) Nil. (v) (a) (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1628 lb./ac.
 (ii) 174.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1598
2.	1748
3.	1539
S.E./mean	= 61.2 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 49(80).

Type :- 'M'.

Object :- To study the effect of T.C. and Farm compost on yield of Cotton.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Dhaincha*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 12.5.1949. (iv) (a) 1 *raja* plough, 4 *desi* ploughs, 4 *sohaga* and 3 cultivators. (b) to (e) N.A. (v) Nil. (vi) M 60 A₂ (medium). (vii) Irrigated. (viii) 2 thinnings and 3 hoeings. (ix) 26.99". (x) 5 pickings from 25.9.1949 to 23.11.1949.

2. TREATMENTS :

1. T.C. at 10 ton/ac.
 2. Farm compost at 10 ton/ac.
 3. Control.
 Manures applied before sowing.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 12' x 74'-4". (b) 12' x 60'-6". (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair to normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948—1950. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1125 lb./ac.
 (ii) 83.14 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1409
2.	1003
3.	964
S.E./mean	= 33.94 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 50(87).

Type :- 'M'.

Object :- To study the effect of T.C. and Farm compost on yield of Cotton.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 16.4.1950. (iv) (a) 7 *desi hal*, 2 horse-hoe and 8 *sohaga*. (b) N.A. (c) 13 sr./ac. (d) and (e) N.A. (v) Nil. (vi) M 60 A₂ (medium). (vii) Irrigated. (viii) 2 to 3 hoeings. (ix) 15.25". (x) 5 pickings from 21.9.1950 to 16.11.1950.

2. TREATMENTS :

1. T.C. at 10 ton/ac.
 2. Farm compost at 10 ton/ac.
 3. Control.
 Manures applied on 16.4.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 10'×74'. (b) 10'×66'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948—1950. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 723.6 lb./ac.
 (ii) 61.81 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	809.0
2.	789.1
3.	572.8
S.E./mean	= 25.23 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :- To study the effect of F.Y.M. and compost on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 25.4.1953. (iv) 1 *raja*, 6 *desi* plough, 4 *sohaga*, 1 horse hoe and 1 roller. (b) Dibbling. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) One gap filling. (ix) 12.44". (x) 4 pickings from 29.9.1953 to 14.11.1953.

2. TREATMENTS :

All possible combinations of (1) and (2)+a control

(1) 2 sources of N : S_1 =Urban compost and S_2 =F.Y.M.

(2) 2 levels of N : L_1 =75 and L_2 =150 lb./ac.

Manures applied on 25.6.1953 by broadcast

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 10'×48'. (b) 10'×45'-5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1294 lb./ac.
 (ii) 144.4 lb./ac.
 (iii) Control vs others effect is highly significant while others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Control = 1077 lb./ac.

	L_1	L_2	Mean
S_1	1344	1437	1391
S_2	1299	1311	1305
Mean	1322	1374	1348

S.E. of any marginal mean = 41.7 lb./ac.
 S.E. of body of table = 59.0 lb./ac.

Crop :- Cotton.
Site :- Cotton Res. Stn., Hansi.

Ref :- Pb. 53 (4).
Type :- 'M'.

Object :- To study the effect of organic manure (G.N.C.) and inorganic manure (A/S) on equal N doses and in combination with F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 2.4.1953. (iv) (a) 4 *desi* plough and 3 *sohaga* levelling. (b) Dibbling. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (medium). (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56". (x) 4 pickings from 15.11.1953 to 10.1.1954.

2. TREATMENTS :

Main-plot treatments .

All combinations of (1) and (2)

(1) 3 levels of F.Y.M. : $F_0=0$, $F_1=100$ and $F_2=200$ md./ac.

(2) 3 sources of N : $Q_1=A/S$, $Q_2=1:1$ mixture of A/S and G.N.C. on N basis and $Q_3=$ Full dose of G.N.C.

Sub-plot treatments :

3 doses of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $10' \times 44'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Height of plants and *kapas* yield. (iv) (a) No. (b) and (c) —. (v) (a) Jullundur and Abohar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 851.2 lb./ac.

(ii) (a) 176.7 lb./ac.

(b) 219.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of *kapas* in lb./ac.

	F_0	F_1	F_2	Mean	N_0	N_1	N_2	Mean
Q_1	901.0	771.6	831.6	834.7	—	785.0	866.1	825.6
Q_2	814.2	884.4	901.5	866.7	—	901.9	801.8	851.8
Q_3	807.4	794.4	955.0	852.3	—	826.9	868.6	847.7
Mean	840.9	815.1	896.0	851.2	870.2	838.0	845.5	
N_0	815.9	907.8	907.8	870.2				
N_1	850.6	735.7	927.6	838.0				
N_2	856.1	327.7	853.7	845.5				

S.E. of difference of two

1. F or Q marginal means in $F \times Q$ table = 41.6 lb./ac.
2. N marginal means = 51.7 lb./ac.
3. N means at the same level of F or Q = 69.5 lb./ac.
4. F or Q means at the same level of N = 84.1 lb./ac.
5. means in the body of $F \times Q$ table = 72.1 lb./ac.
6. Q marginal mean in $Q \times N$ table = 51.0 lb./ac.

Crop :- Cotton (*Kharif*).

Ref :- Pb. 51(86).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different doses of A/S on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 24.4.1951. (iv) (a) 5 *desi hal* and 3 *sohaga*. (b) N.A. (c) 2 sr./ac. (d) and (e) N.A. (v) 10 ton/ac. of compost by broadcast on 30.3.51. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling, 2 hoeings and weeding. (ix) 14.13". (x) N.A.

2. TREATMENTS :

1. Control (no manure).
2. 25 lb./ac. of N as A/S.
3. 37.5 lb./ac. of N as A/S.
4. 50 lb./ac. of N as A/S.

A/S broadcast on 3.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 110' x 12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Jassid attack ; spray with DDT. (iii) *Kapas* yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1659 lb./ac.

(ii) 90.3 lb./ac.

(iii) Treatment differences are highly significant.

(iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1584
2.	1595
3.	1721
4.	1736
S.E./mean	= 36.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(53).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of different doses of N as A/S on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Jullundur. (iii) 15.5.1952. (iv) (a) 2 *raja* plough, 3 *desi* plough and 4 *sohaga*. (b) N.A. (c) 13 sr./ac. (d) 1' x 1'. (e) N.A. (v) Nil. (vi) F-320. (medium). (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 29.82". (x) 5 pickings from 15.10.1952 to 5.1.1953.

2. TREATMENTS :

1. Control.
2. 25 lb./ac. of N as A/S.
3. 37½ lb./ac. of N as A/S.
4. 50 lb./ac. of N as A/S.

A/S broadcast in two equal doses on 12.7.1952 and 3.8.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 99' x 11'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Germination and growth good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1951-1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1938 lb./ac.
 (ii) 135.6 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1829
2.	2004
3.	1924
4.	1996
S.E./mean	= 60.6 lb./ac.

Crop :- Cotton.

Ref :- Pb. 51(88).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'

Object : -To study the effect of different sources of N on the yield of Cotton crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.5.1951. (iv) (a) 3 *desi* plough and 3 *sohaga*. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) 216-F (medium). (vii) Irrigated. (viii) 3 hoeings with *khurpa* and one with horsehoe. (ix) 14.43". (x) N.A.

2. TREATMENTS :

- 10 ton/ac. of F.Y.M.
- 10 ton/ac. of compost.
- 30 lb./ac. of N as A/S.
- 45 lb./ac. of N as A/S.
- 60 lb./ac. of N as A/S.
- 75 lb./ac. of N as A/S.
- Control.

F.Y.M. and compost applied on 12.5.1951 i.e., before sowing and A/S on 28.7.1951.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 103' × 10'. (v) No. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Jassid attack in Sept. and Oct. DDT sprayed. (iii) *Kapas* yield. (iv) (a) 1951-52. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Originally experiment was conducted with five replications, but yield data was available for only 4 replications. Hence analysis is done with 4 replications.

5. RESULTS :

- (i) 265.5 lb./ac.
 (ii) 50.46 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatments	Av. yield
1.	259.6
2.	307.2
3.	292.3
4.	271.9
5.	227.0
6.	233.8
7.	266.4
S.E./mean	= 25.23 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(62).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :-To study the effect of different sources of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 14.5.1952. (iv) (a) 1 *raja* plough, 5 *desi* and 3 *sohaga*. (b) N.A. (c) 8 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) 1 thinning, 2 weedings and 3 hoeings. (ix) 29.82". (x) 4 pickings from 16.10.1952 to 12.12.1952.

2. TREATMENTS :

1. 10 ton/ac. of F.Y.M.
2. 10 ton/ac. of compost.
3. 30 lb./ac. of N as A/S.
4. 45 lb./ac. of N as A/S.
5. 60 lb./ac. of N as A/S.
6. 75 lb./ac. of N as A/S.
7. Control (no manure).

Manures applied by broadcast. F.Y.M. and compost applied before sowing and A/S in two equal doses on 12.7.1952 and 3.8.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 1/41.9th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1951-1952. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2008 lb./ac.
 (ii) 92.05 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1935
2.	1908
3.	2030
4.	2034
5.	2160
6.	2167
7.	1821
S.E./mean	= 41.16 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53 (88).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :-To study the effect of different levels of N on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) A/S in two equal doses of 20 lb./ac. of N each on 23.11.1952 and 30.12.1952. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 10.5.1953. (iv) (a) 2 *raja* plough, 3 *desi hal* and 4 *sohaga*. (b) N.A. (c) 14 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-320. (medium). (vii) Irrigated. (viii) 2 hoeings, 1 thinning, one hoeing with horse hoe and one weeding. (ix) 25.73". (x) 2 pickings from 16.10.1953 to 13.12.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of F.Y.M. : $F_0=0$, $F_1=100$ and $F_2=200$ md./ac.

Sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac. of N.

A/S applied on 9.9.1953 and F.Y.M. before sowing by broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 66' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) DDT spray on 8.6.1953 but records do not show any attack of pest or disease. (iii) *Kapas* yield. (iv) (a) 1953-contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vi) Nil.

5. RESULTS :

- (i) 1812 lb./ac.
 (ii) (a) 237.2 lb./ac.
 (b) 139.5 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
F_0	1734	1770	1736	1747
F_1	1814	1853	1882	1850
F_2	1882	1843	1796	1840
Mean	1810	1822	1805	1812

S.E. of difference of two

1. F marginal means = 86.7 lb./ac.
 2. N marginal means = 50.9 lb./ac.
 3. N means at the same level of F = 88.2 lb./ac.
 4. F means at the same level of N = 112.7 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53 (87).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of N, with respect to its application and P_2O_5 on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 2.5.1953. (iv) (a) one *raja* plough, 6 *desi* plough, 2 *sohaga* and 1 horse hoe. (b) N.A. (c) 12 to 14 sr/ac. (d) and (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) 1 horse hoe, 1 weeding and 1 thinning. (ix) 25.73%. (x) 6 pickings from 4.10.1953 to 11.12.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 6 levels of N as A/S : $N_0=0$, $N_1=25$, $N_2=50$, $N_3=75$, $N_4=100$ and $N_5=125$ lb./ac.
 (2) 3 times of application of N : T_1 =Half at sowing and half at flowering, T_2 =Half at thinning and half at flowering T_3 =Full dose at flowering.

Sub-plot treatments :

2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 42'×8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 756.8 lb./ac.
 (ii) (a) 179.9 lb./ac.
 (b) 96.8 lb./ac.
 (iii) No effect is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	P ₀	P ₁	Mean	T ₁	T ₂	T ₃
N ₀	713.9	722.3	718.1	—	—	—
N ₁	818.1	726.4	772.3	866.7	650.0	800.1
N ₂	744.5	801.4	773.0	773.0	760.5	785.5
N ₃	852.8	880.6	866.7	887.5	902.2	810.5
N ₄	762.6	745.9	754.2	748.0	623.0	891.7
N ₅	666.7	645.9	656.3	600.0	577.1	791.7
Mean	759.8	753.8	756.8	775.0	702.6	815.9
T ₁	775.8	752.1	763.9			
T ₂	729.9	668.8	699.4			
T ₃	773.7	840.3	807.0			

S.E. of difference of two

1. N marginal means = 73.45 lb./ac.
2. T marginal means in N×T table = 56.89 lb./ac.
3. T marginal means in P×T table = 51.94 lb./ac.
4. P marginal means = 22.81 lb./ac.
5. P means at the same level of N = 55.88 lb./ac.
6. N means at the same level of P = 83.41 lb./ac.
7. T means at the same level of N = 39.52 lb./ac.
8. N means at the same level of T = 59.00 lb./ac.
9. means in N×T table = 127.22 lb./ac.

Crop :- Cotton (*Kharif*).

Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 51(87).

Type :- 'M'.

Object :- To study the effect of A/S, G.N.C. and their mixture on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 6.5.1951. (iv) (a) 2 *desi hal* and 1 *sohaga*. (b) N.A. (c) 12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling, 2 weedings and 2 hoeings. (ix) 14.13". (x) 4 pickings from 12.9.1951 to 19.12.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 sources of N : $S_1=A/S$, $S_2=G.N.C.$ and $S_3=A/S$ and $G.N.C.$ in 1 : 1 ratio.

(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

Manures applied on 20.7.1951.

3. DESIGN :

(i) (a) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) $72' \times 7'' \times 10'$. (b) $66' \times 6'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good, growth condition satisfactory. No lodging. (ii) Jassid attack, D.D.T sprayed. (iii) *Kapas* yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1121 lb./ac.

(ii) 135.7 lb /ac.

(iii) Main effect of N is highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	S_1	S_2	S_3	Mean
N_0	—	—	—	897
N_1	1129	1095	1106	1110
N_2	1355	1276	1437	1356
Mean	1242	1186	1272	1121

S.E. of marginal mean of S =42.9 lb./ac.

S.E. of marginal mean of N =35.0 lb./ac.

S.E. of body of table =55.4 lb./ac.

Crop :- Cotton.

Site :- Agri. Stn., Karnal.

Ref :- Pb. 50(72).

Type :- 'M'.

Object :- To study the best source of N for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 20.5.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) M 60 A_2 (medium). (vii) Irrigated. (viii) One weeding cum hoeing. (ix) 32.87%. (x) 4 pickings from 27.9.1950 to 14.12.1950.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 4 sources of N : $S_1=A/S$, $S_2=Ammono. Phos.$ and $S_3=Mohua Cake$ and $S_4=F.Y.M.$

(2) 2 levels of N : $N_1=75$ and $N_2=100$ lb./ac.

Mohua Cake applied before sowing and A/S and Ammono. Phos. on 13.9.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) $12' \times 80'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1950-1951. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

- (i) 404.7 lb./ac.
(ii) 60.96 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of *kapas* in lb./ac.

Control=401.0 lb./ac.

	N ₁	N ₂	Mean
S ₁	421.5	394.5	408.0
S ₂	395.9	390.8	393.3
S ₃	343.4	455.7	399.5
S ₄	421.5	417.8	419.6
Mean	395.6	414.7	405.1

S.E. of marginal mean of S =21.55 lb./ac.
S.E. of marginal mean of N =15.24 lb./ac.
S.E. of body of table =30.48 lb./ac.

Crop :- Cotton.

Ref :- Pb. 51(59).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :-To study the best source of N for Cotton crop.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 31.5.1951. (iv) (a) 3 ploughings and 2 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) F-216. (medium). (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 14.52". (x) 3 pickings; dates N.A.

2. TREATMENTS:

All combinations of (1) and (2)+a control.

(1) 4 sources of N: S₁=A/S, S₂=Ammo. Phos., S₃=*Mohua* cake and S₄=F.Y.M.(2) 2 levels of N: N₁=75 and N₂=100 lb./ac.

A/S and Ammo. Phos. applied on 25.8.1951 by broadcast.

3. DESIGN:

- (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×80'. (v) Nil. (vi) Yes.

4. GENERAL:

- (i) Fair to satisfactory. No lodging. (ii) Slight attack of bollworm. (iii) *Kapas* yield. (iv) (a) 1950-1951. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1469 lb./ac.
(ii) 173.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of *kapas* in lb./ac.

Control =1357 lb./ac.

	N ₁	N ₂	Mean
S ₁	1412	1493	1452
S ₂	1559	1558	1559
S ₃	1444	1275	1359
S ₄	1565	1561	1563
Mean	1495	1472	1483

S.E. of marginal means of S =61.3 lb./ac.
S.E. of marginal means of N =43.3 lb./ac.
S.E. of body of table =86.6 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(76).

Site :- Chemical Section, Bhupendra Agri. Farm, Rauni. Type :- 'M'.

Object:—To study the suitability of application of F.Y.M. and *Toria* cake alone and in combination with A/S on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 20.5.1952. (iv) (a) and (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 4 hoeings and 1 thinning. (ix) 20.92°. (x) 5 pickings from 30.9.1952 to 22.12.1952.

2. TREATMENTS :

1. Control.
2. 25 lb./ac. of N as A/S.
3. 25 lb./ac. of N as F.Y.M.
4. 25 lb./ac. of N as *Toria* cake.
5. 50 lb./ac. of N as A/S.
6. 25 lb./ac. of N as A/S+25 lb./ac. of N as F.Y.M.
7. 25 lb./ac. of N as A/S+25 lb./ac. of N as *Toria* cake.

A/S applied on 14.8.1952 by broadcast, while F.Y.M. and *Toria* cake applied before sowing on 20.5.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 20.5' × 92'. (b) 16.5' × 88'. (v) 2' border all round. (vi) Yes.

4. GENERAL :

(i) Normal. Crop lodged on 22.8.1952 due to high winds and rain. (ii) *Bhundi* attack (Red Cotton Bug). (iii) *Kapas* yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1124 lb./ac.
 (ii) 118.0 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	920
2.	1188
3.	1059
4.	1048
5.	1204
6.	1155
7.	1291
S.E./mean	= 59.0 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(106).

Site :- Chemical Section, Bhupendra Agri. Farm, Rauni. Type :- 'M'.

Object:—To study the suitability of application of F.Y.M. and *Toria* cake alone and in combination with A/S on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 11.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 hoeings, 2 triphally and 1 thinning. (ix) 22.73°. (x) 3 pickings on 6.10.1953, 2.11.1953 and 21.12.1953.

2. TREATMENTS :

1. Control.
2. 25 lb./ac. of N as A/S.
3. 25 lb./ac. of N as F.Y.M.
4. 25 lb./ac. of N as *Toria* cake.
5. 50 lb./ac. of N as A/S.
6. 25 lb./ac. of N as F.Y.M. + 25 lb./ac. of N as A/S.
7. 25 lb./ac. of N as *Toria* cake + 25 lb./ac. of N as A/S.

Manures applied by broadcast. F.Y.M. and *Toria* cake applied on 4.5.1953 and A/S on 17.8.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 91.75'×19'. (b) 77.75'×14'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) 1952—1954. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1021 lb./ac.
 (ii) 110.0 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	769
2.	1260
3.	1041
4.	892
5.	1031
6.	1066
7.	1088
S.E./mean	= 55.0 lb./ac.

Crop :- Cotton (*Kharif*).

Site :- Cotton Res. Stn., Jullundur.

Ref :- Pb. 53(147).

Type :- 'M'.

Object :—To study the effect of early and late application of manure to Cotton crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 19.30". (x) 3 pickings on 5.11.1953, 19.11.1953 and 9.12.1953.

2. TREATMENTS :

All combinations of (1) and (2) +a control

- (1) 2 sources of 50 lb./ac. of N : $S_1=A/S$ and $S_2=C/N$.

- (2) 2 times of application : $T_1=$ Early at thinning and $T_2=$ Late at flowering.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 8'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1433 lb./ac.
 (ii) 217.1 lb./ac.
 (iii) Only control vs. others effect is significant.

(iv) Av. yield of *kapas* in lb./ac.

Control=1115 lb./ac.			
	S ₁	S ₂	Mean
T ₁	1342	1601	1472
T ₂	1439	1666	1553
Mean	1391	1634	1513

S.E. of any marginal mean = 88.6 lb./ac.
S.E. of body of table = 125.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53 (167).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of N on yield of Cotton when applied with and with out lime.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 19.30". (x) 5.11.1953, 19.11.1953 and 9.12.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : L₀=0 and L₁=20 lb./ac.

(2) 4 applications of N : N₀=0, N₁=50 lb./ac. of N as A/S, N₂=50 lb./ac. of N as C/N and N₃=50 lb./ac. of N as A/S and C/N.

3. DESIGN :

(i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 8'×36'. (b) 8'×35'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1646 lb./ac.

(ii) 110.8 lb./ac.

(iii) Only N effect is highly significant.

(iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	N ₃	Mean
L ₀	1250	1660	1907	1690	1628
L ₁	1277	1647	1924	1814	1664
Mean	1264	1654	1916	1752	1646

S.E. of marginal mean of L = 45.2 lb./ac.
S.E. of marginal mean of N = 32.0 lb./ac.
S.E. of body of table = 63.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53 (169).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'M'.

Object :- To study the effect of application of P_2O_5 with N, applied to previous crops, on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) As per treatments. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) End of April (date N.A.). (iv) (a) to (e) N.A. (v) N.A. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 19.30". (x) 3 pickings on 21.10.1953, 9.11.1953 and 5.12.1953.

2. TREATMENTS :

Main-plot treatments :

5 previous crops : R_1 =Guara, R_2 =Gram, R_3 =Berseem, R_4 =Wheat and R_5 =Fallow.

Sub-plot treatments :

2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

Sub-sub-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8'x55'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Above normal. No lodging. (ii) Slight attack of Jassid ; no control measures taken. (iii) *Kapas* yield. (iv) (a) 1953-contd. (b) No. (c) —. (v) (a) Hansi and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1804 lb./ac.
 (ii) (a) 240.2 lb./ac.
 (b) 150.9 lb./ac.
 (c) 175.0 lb./ac.
 (iii) R effect is significant. N effect and interaction $R \times N$ are highly significant while others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	P_0	P_1	Mean	N_0	N_1	N_2
R_1	1875	1917	1896	1835	1906	1946
R_2	1800	1780	1790	1636	1797	1938
R_3	1799	1816	1808	1597	1852	1974
R_4	1618	1708	1663	1236	1798	1955
R_5	1833	1889	1861	1706	1918	1959
Mean	1785	1822	1804	1602	1854	1955
N_0	1593	1611	1602			
N_1	1813	1895	1854			
N_2	1945	1960	1955			

S.E. of difference of two

1. R marginal means = 69.3 lb./ac.
2. P marginal means = 27.6 lb./ac.
3. N marginal means = 39.2 lb./ac.
4. P marginal means at the same levels of R = 61.6 lb./ac.
5. R marginal means at the same level of P = 81.9 lb./ac.
6. N marginal means at the same level of R = 87.5 lb./ac.
7. R marginal means at the same level of N = 99.6 lb./ac.
8. N marginal means at the same level of P = 55.4 lb./ac.
9. P marginal means at the same level of N = 52.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(139).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'M'.

Object :- To find an organic substitute for A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 14.5.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) N.A. (ix) 29.30". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 sources of N : $S_1=A/S$, $S_2=G.N.C.$ and $S_3=1 : 1$ mixture of A/S and G.N.C.(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $5' \times 9' \times 40'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Abohar and Hansi. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1540 lb./ac.
 (ii) 301.9 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
S_1	—	1536	1564	1550
S_2	—	1445	1642	1544
S_3	—	1676	1653	1665
Mean	1449	1552	1620	

S.E. of marginal mean of N = 71.2 lb./ac.
 S.E. of marginal mean of S = 87.2 lb./ac.
 S.E. of body of table = 123.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(168).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'M'.

Object :- To find out the best source of N at varying levels of F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) N.A. (ix) 19.30". (x) Pickings on 28.10.1953, 17.11.1953 and 8.12.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of F.Y.M. : $F_0=0$, $F_1=100$ and $F_2=200$ md./ac.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 sources of N : $S_1=A/S$, $S_2=G.N.C.$ and $S_3=1 : 1$ mixture of A/S and G.N.C.(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot (a) 8'×36'. (b) 8'×35'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Mild attack of Jassid. (iii) *Kapas* yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1826 lb./ac.
 (ii) (a) 91.43 lb./ac.
 (b) 159.57 lb./ac.
 (iii) Main effects of F and S are highly significant. Main effect of N is significant while others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	S ₁	S ₂	S ₃	Mean	N ₀	N ₁	N ₂
F ₀	1814	1692	1793	1766	1542	1820	1937
F ₁	1969	1824	1806	1866	1756	1834	2009
F ₂	1929	1709	1902	1847	1669	1861	2010
Mean	1904	1742	1834	1826	1656	1838	1985
N ₀	—	—	—	1656			
N ₁	1909	1711	1894	1838			
N ₂	2089	1860	2007	1985			
Mean	1999	1785	1950				

S.E. of difference of two

1. F marginal means =21.55 lb./ac.
2. S marginal means in F×S table =37.62 lb./ac.
3. S marginal means in N×S table =46.06 lb./ac.
4. N marginal means =37.62 lb./ac.
5. means in the body of N×S table =65.14 lb./ac.
6. N or S means at the same level of F =65.14 lb./ac.
7. F means at the same level of N×S =57.39 lb./ac.

Crop :- Cotton.

Ref :-Pb. 53(171).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'M'.

Object :-To study the effect of graded doses of N and P₂O₅ and the time of application of N.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 1 to 3.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) One thinning. (ix) 19.30". (x) Picking on 13.10.1953, 2.11.1953 and 3.12.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 6 levels of N as A/S : N₀=0, N₁=25, N₂=50, N₃=75, N₄=100 and N₅=125 lb./ac.
- (2) 2 times of application : T₁=Half at sowing + half at flowering, T₂=Half at thinning + half at flowering and T₃=Full dose at flowering.

Sub-plot treatments :

2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 18 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Sub-plot 8'×41.25'. (v) N.A. (vi) Yes.

4. GENERAL .

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1953—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1580 lb./ac.
 (ii) (a) 253.8 lb./ac.
 (b) 152.9 lb./ac.
 (iii) N effect is highly significant, T effect is significant while other effect and interactions are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	N ₅	Mean	T ₁	T ₂	T ₃
P ₀	1268	1480	1607	1721	1701	1617	1566	1543	1515	1639
P ₁	1244	1450	1636	1764	1793	1685	1595	1603	1518	1665
Mean	1256	1465	1621	1742	1747	1651	1580	1573	1516	1652
T ₁	—	1486	1651	1792	1572	1711	1642			
T ₂	—	1378	1579	1643	1684	1575	1572			
T ₃	—	1532	1635	1793	1985	1666	1722			

S.E. of difference of two

1. N marginal means = 73.3 lb./ac.
2. P marginal means = 25.5 lb./ac.
3. T marginal means in P×T table = 51.8 lb./ac.
4. T marginal means in N×T table = 56.8 lb./ac.
5. means in N×T table = 126.9 lb./ac.
6. P means at the same level of N = 62.4 lb./ac.
7. N means at the same level of P = 85.5 lb./ac.
8. P means at the same level of T = 44.1 lb./ac.
9. T means at the same level of P = 60.5 lb./ac.

Crop :- Cotton (*Kharif*).

Ref :- Pb. 52(140).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'CM'.

Object :- To study the effect of manuring in relation to sowing dates and spacing.

1. BASAL CONDITIONS :

(i) (a) Wheat—Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 29.30". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 2 dates of sowing : D₁=26.4.1952 and D₂=17.5.1952.
- (2) 2 spacings : S₁=2'×1' and S₂=2'×1.5'.

Sub-p of treatments :

3 levels of N as A/S : N₀=0, N₁=50 and N₂=100 lb./ac.

Sub-sub-plot treatments :

2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/block ; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot : 40' × 39', sub-sub-plot : 20' × 39'. (b) Sub-plot : 24' × 39', sub-sub-plot : 12' × 33'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair to good. No lodging. (ii) Mild attack of Jassid on late sown plots. No control measures. (iii) *Kapas* yield. (iv) (a) 1952—continued with modifications. (b) No. (c) Nil. (v) (a) Hansi and Abohar. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1589 lb./ac.
 (ii) (a) 253.5 lb./ac.
 (b) 341.6 lb./ac.
 (c) 187.9 lb./ac.
 (iii) Main effect of D is highly significant. Others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁	S ₁	S ₂
D ₁	1548	1826	1737	1704	1688	1719	1722	1685
D ₂	1378	1496	1547	1474	1493	1455	1496	1452
Mean	1463	1661	1642	1589	1590	1587	1609	1569
S ₁	1494	1649	1683	1609	1620	1597		
S ₂	1432	1673	1600	1568	1560	1576		
P ₀	1461	1656	1654	1590				
P ₁	1465	1666	1630	1587				

S.E. of difference of two

1. D or S marginal means = 51.8 lb./ac.
2. N marginal means = 85.4 lb./ac.
3. P marginal means = 38.3 lb./ac.
4. N means at the same level of D or S = 120.8 lb./ac.
5. D or S means at the same level of N = 111.4 lb./ac.
6. P means at the same level of N = 66.4 lb./ac.
7. N means at the same level of P = 97.5 lb./ac.
8. P means at the same level of D or S = 54.2 lb./ac.
9. D or S means at the same level of P = 64.4 lb./ac.
10. means in body of S × D table = 73.1 lb./ac.

Crop :- Cotton.

Ref :- 53(170).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'CM'.

Object :—To study the effect of different doses of A/S on yield of Cotton with variable spacing and sowing dates.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) F-320 (medium). (vii) Irrigated. (viii) N.A. (ix) 19.30°. (x) Picking on 28.10.1953, 14.1.1953 and 7.12.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 dates of sowing : $D_1=26.4.1953$, $D_2=17.5.1953$ and $D_3=2.6.1953$.(2) 3 spacings : $S_1=2' \times 1'$, $S_2=2 \times 1.5'$ and $S_3=2' \times 2'$.

Sub-plot treatments :

3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot $8' \times 36'$. (b) $8' \times 35'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Above normal. No lodging. (ii) Slight attack of Jassid. (iii) *Kapas* yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) Hansi, Abohar. (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS :

(i) 1716 lb./ac.

(ii) (a) 278.0 lb./ac.

(b) 176.0 lb./ac.

(iii) Main effects of S and N are highly significant. Interaction $S \times N$ is significant. Others are not significant.(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2	S_3
D_1	1389	2007	2250	1882	1839	1920	1888
D_2	1454	1783	2014	1750	1793	1827	1632
D_3	1169	1516	1862	1516	1526	1525	1496
Mean	1337	1769	2042	1716	1719	1757	1672
S_1	1330	1772	2055	1719			
S_2	1358	1773	2142	1757			
S_3	1325	1761	1929	1672			

S.E. of difference of two

1. D or S marginal means = 65.5 lb./ac.
2. N marginal means = 41.4 lb./ac.
3. N means at the same level of D or S = 71.8 lb./ac.
4. D or S means at the same level of N = 37.9 lb./ac.
5. means in body of $D \times S$ table = 113.6 lb./ac.

Crop :- Cotton (*Kharif*).

Ref :- Pb. 52(1).

Site :- Cotton Res. Stn., Jullundur.

Type :- 'ICM'.

Object :—To study the effect of graded doses of N for A/S with special reference to watering and spacing on Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 6.5.1952. (iv) (a) to (e) N.A. (v) [Nil. (vi) F-320. (vii) Irrigated. (viii) N.A. (ix) 29.30". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2).

(1) 2 irrigations : I_1 =Light and I_2 =Heavy.(2) 2 spacings : $S_1=2' \times 1.5'$ and $S_2=2' \times 2'$.

Sub-plot treatments :

6 levels of N as A/S : $N_0=0$, $N_1=25$, $N_2=50$, $N_3=75$, $N_4=100$ and $N_5=125$ lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot $14' \times 33'$. (b) sub-plot $12' \times 33'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) Hansi and Abohar. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1552 lb./ac.

(ii) (a) 292.5 lb./ac.

(b) 222.1 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	N_3	N_4	N_5	Mean	S_1	S_2
I_1	1549	1516	1520	1560	1471	1646	1544	1559	1528
I_2	1585	1653	1679	1477	1478	1482	1559	1597	1521
Mean	1567	1585	1600	1519	1475	1564	1552	1578	1525
S_1	1553	1694	1602	1543	1532	1545	1572		
S_2	1581	1475	1597	1495	1417	1584	1525		

S.E. of difference of two

1. I or S marginal means = 59.7 lb./ac.
2. N marginal means = 78.5 lb./ac.
3. N means at the same level of I or S = 111.0 lb./ac.
4. I or S means at the same level of N = 117.7 lb./ac.
5. means in the body of $I \times S$ table = 84.4 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 53(71).

Type :- 'MV'.

Object :- To study the time and method of application of A/S for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Senji*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 21.4.1953. (iv) (a) 4 ploughings, 6 *sohaga* and 2 horse hoe. (b) N.A. (c) 6—12 sr./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) 34.00%. (x) 25.9.1953 to 20.12.1953.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =F-320 (medium) and V_2 =231-R (medium).

Sub-plot treatments :

7 applications of N : N_0 =Control, N_1 =30 lb./ac. of N in A/S just before flowering (14.7.1953), N_2 =30 lb./ac. of N with 2nd irrigation on 2.6.1953, N_3 =10 lb./ac. of N drilled at sowing+10 lb./ac. of N just before flowering+10 lb./ac. of N with 2nd irrigation, N_4 =15 lb./ac. of N with 2nd irrigation+15 lb./ac. of N just before flowering, N_5 =30 lb./ac. of N drilled at sowing time and N_6 =15 lb./ac. of N drilled at sowing+15 lb./ac. of N before flowering by broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 7 sub-plots/main-plot. (iii) 4. (iv) (a) 91'×20'. (b) 91'×16'. (v) 2½' on one side and 1½' on the other side of each plot. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1953-1954 (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 613.6 lb./ac.
 (ii) (a) 139.14 lb./ac.
 (b) 89.88 lb./ac.
 (iii) Main effect of V is highly significant. Others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	V ₁	V ₂	Mean
N ₀	766.5	482.8	624.7
N ₁	700.1	421.2	560.7
N ₂	750.1	481.8	616.0
N ₃	769.4	540.5	655.0
N ₄	750.1	506.8	628.5
N ₅	694.4	498.2	596.3
N ₆	731.9	496.2	614.1
Mean	737.5	489.6	613.6

S.E. of difference of two

1. V marginal means =37.19 lb./ac.
2. N marginal means =44.94 lb./ac.
3. N means at the same level of V =63.55 lb./ac.
4. V means at the same level of N =69.61 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(102).

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Type :- 'C'.

Object :- To determine the optimum sowing time and spacing for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 4 ploughings and 2 *sohaga*. (b) Dibbling. (c) 8—10 sr./plot. (d) As per treatments. (e) N.A. (v) 7 ton/ac. of F.Y.M. on 15, 18.2.1953. 30 lb./ac. of N as A/S. (vi) F-320 (medium) (vii) Irrigated. (viii) One thinning, two hoeings and one weeding. (ix) 21.75". (x) 28.10.1953 to 16.11.1953 (4 pickings).

2. TREATMENTS :

Main-plot treatments :

6 dates of sowing : D₁=1.4.1953, D₂=12.4.1953, D₃=24.4.1953, D₄=6.5.1953, D₅=18.5.1953 and D₆=1.6.1953.

Sub-plot treatments :

2 spacings : S₁=2'×1½' and S₂=2½'×1½'.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main : 55'×30', sub : 55'×15'. (b) Main 49.5'×20', sub : 49.5'×10'. (v) One row left on each side. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Boll no., boll weight, height and *kapas* yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1555 lb./ac.
 (ii) (a) 190.4 lb./ac.
 (b) 113.1 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	Mean
S ₁	1508	1543	1645	1495	1626	1509	1554
S ₂	1537	1628	1577	1533	1543	1515	1556
Mean	1523	1586	1611	1514	1585	1512	1555

S.E. of difference of two

1. D marginal means = 95.2 lb./ac.
 2. S marginal means = 32.7 lb./ac.
 3. S means at the same level of D = 78.0 lb./ac.
 4. D means at the same level of S = 110.7 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Ref :- Pb. 52 (68).

Type :- 'C'.

Object ;—To find the optimum sowing time and spacing for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 2 *sohaga*. (b) N.A. (c) 8-10 sr./ac. (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as A/S on 19.7.1952. (vi) F-216 (early). (vii) Irrigated. (viii) 3 hoeings, 1 weeding and 2 thinnings. (ix) 7.44". (x) 7.10.1952 to 27.11.1952.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=15.5.1952, D₂=1.6.1952 and D₃=15.6.1952.

Sub-plot treatments :

2 spacings : S₁=2'×1' and S₂=2½'×1½'.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot : 99'×10'. (b) Sub-plot : 90½'×10'. (v) Approximately 4' left as border on each side along breadth. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 661.1 lb./ac.
 (ii) (a) 84.68 lb./ac.
 (b) 69.86 lb./ac.
 (iii) Main effect of D is highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	S ₁	S ₂	Mean
D ₁	765.3	680.4	722.9
D ₂	735.9	808.5	772.2
D ₃	486.0	490.6	488.3
Mean	662.4	659.8	661.1

S.E. of difference of two

1. D marginal means = 42.34 lb./ac.
2. S marginal means = 28.52 lb./ac.
3. S means at the same level of D = 49.40 lb./ac.
4. D means at the same level of S = 54.89 lb./ac.

Crop :- Cotton (*Kharif*).

Site :- Govt. Agri. Stn., Gurdaspur.

Ref :- Pb. 51 (75).

Type :- 'C'.

Obejct :—To find out the best time of sowing for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 *desi* plough, 6 *sohaga* and 1 roller. (b) and (c) N.A. (d) row to row 1' (e) N.A. (v) Nil. (vi) 231-R (medium). (vii) Irrigated. (viii) 1 gap filling and one hoeing cum weeding. (ix) 15.57". (x) 20.10.1951 to 20.12.1951.

2. TREATMENTS :

6 dates of sowing : D₁=5.4.1951, D₂=18.4.1951, D₃=16.5.1951, D₄=31.5.1951, D₅=5.6.1951 and D₆ 19.6.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 1/45 (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1951 to 1955. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 623.4 lb./ac.
- (ii) 92.11 lb./ac.
- (iii) Treatment differences are not significant.
- (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
D ₁	757.9
D ₂	673.1
D ₃	572.8
D ₄	576.6
D ₅	568.9
D ₆	591.1
S.E./mean	= 37.60 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(38).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'C'.

Object :- To find out the best time of sowing for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Senji*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings and 6 *sohaga*. (b) N.A. (c) 4 chh./plot. (d) and (e) N.A. (v) 12 C.L. of F.Y.M. on 13.3.1952. (vi) 231-R (medium). (vii) Irrigated. (viii) 2 hoeings and 2 horse hoe. (ix) 22.43". (x) 9.9.1952 to 11.12.1952.

2. TREATMENTS :

6 dates of sowing : $D_1=24.3.1952$, $D_2=15.4.1952$, $D_3=29.4.1952$, $D_4=15.5.1952$, $D_5=1.6.1952$ and $D_6=16.6.1952$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Leaf roller attack. Agroicide sprayed on 29.8.1952. (iii) *Kapas* yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 894.1 lb./ac.
 (ii) 101.91 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
D_1	1230.9
D_2	1221.0
D_3	1110.4
D_4	858.4
D_5	552.9
D_6	390.9
S.E./mean	= 41.60 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(74).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'C'.

Object :- To find out the best time of sowing for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Senji*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings and 2 *sohaga*. (b) N.A. (c) 4 chh./plot. (d) 2 ft. between rows. (e) N.A. (v) 10 C.L. of F.Y.M. on 9.3.1953 by broadcast. (vi) 231-R (medium). (vii) Irrigated. (viii) 2 hoeing, 2 horse hoe and on thinning. (ix) 34.00" (x) 25.9.1953 to 24.11.1953.

2. TREATMENTS :

6 dates of sowing : $-D_1=15.3.1953$, $D_2=1.4.1953$, $D_3=15.4.1953$, $D_4=1.5.1953$, $D_5=15.5.1953$ and $D_6=1.6.1953$.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 90.15' x 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging (ii) Jassid attack, spraying of DDT on 26.7.1953. (iv) (a) 1951-1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 729.1 lb./ac.
 (ii) 62.56 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
D ₁	803.1
D ₂	723.4
D ₃	841.7
D ₄	826.3
D ₅	715.7
D ₆	464.6
S.E./mean	= 25.54 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 49(79).

Type :- 'C'.

Object :— To study the effect of spacing on yield of Cotton.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Dhaincha*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 6.4.1949. (iv) (a) 1 *raja* plough, 1 *desi* plough and 1 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling and 3 hoeings. (ix) 26.99°. (x) 6.9.1953 to 25.11.1953.

2. TREATMENTS :

4 spacings : S₁=9' apart, S₂=1' apart, S₃=1½' apart and S₄=2' apart.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'×75'. (b) 12'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 651.5 lb./ac.
 (ii) 66.5 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
S ₁	624.9
S ₂	685.3
S ₃	659.6
S ₄	636.4
S.E./mean	= 27.14 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 49(77).

Type :- 'C'.

Object :—To compare different methods of sowing Cotton.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 4.4.1949. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling and 1 hoeing. (ix) 26.29°. (x) 27.9.1953 to 25.11.1953.

2. TREATMENTS :

1. Sown in lines.
2. sown by broadcast.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) 18'×75'. (b) 18'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949-1950. (b) and (c) No. (v) (a) and (b) Nil. (vi) Nil. (vii) Due to heavy rain in July plots were damaged as water stagnated. Certain plants died out while in others there was severe shedding of cotton.

5. RESULTS :

- (i) 316.0 lb./ac.
- (ii) 61.65 lb./ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	248.1
2.	383.8
S.E./mean	= 21.80 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 50 (90).

Type :- 'C'.

Object :—To compare the different methods of sowing Cotton.]

1. BASAL CONDITIONS :

(i) (a) *Guara* (G.M.)—Cotton. (b) *Guara* (G.M.). (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 9.4.1950. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 hoeings and 1 weeding. (ix) 15.25". (x) 9.10.1950 to 30.10.1950.

2. TREATMENTS :

1. Sown in lines.
2. Sown by broadcast.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/40th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1235 lb./ac.
- (ii) 112.0 lb./ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	1385
2.	1085
S.E./mean	= 39.6 lb./ac.

Crop :- Cotton.

Ref :- Pb. 51 (29).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'C'.

Object :—To study the best date of topping for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 7.5.1951. (iv) (a) 6 *desi* plough and 5 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) 50 lb./ac. of N as F.Y.M. by broadcast. (vi) M 60 A₂ (medium). (vii) Irrigated. (viii) N.A. (ix) 8.02". (x) 29.9.1951 to 11.11.1951 (4 pickings).

2. TREATMENTS :

Four dates of topping :

1. No topping.
2. 15th June.
3. 30th June.
4. 15th July.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'×75'. (b) 12'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 612.6 lb./ac.
 (ii) 101.1 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	600.4
2.	644.1
3.	618.4
4.	587.6
S.E./mean	= 41.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 51(28).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'C'.

Object :—To study the best date of topping for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 7.5.1951. (iv) (a) 1 *raja* plough, 1 *desi* plough, 2 *desi* harrow and 3 *sohaga*. (b) N.A. (c) 15 sr./ac. (d) and (e) N.A. (v) 50 lb./ac. of N as F.Y.M. broadcast. (vi) F-216 (medium). (vii) Irrigated. (viii) 5 hoeings and one thinning. (ix) 8.02". (x) Pickings on 29.9.1951, 16.10.1951 and 10.11.1951.

2. TREATMENTS :

1. No topping.
2. Topping on 15th June.
3. Topping on 30th June.
4. Topping on 15th July.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12'×75'. (b) 12'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 820.3 lb./ac.
 (ii) 151.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	736.7
2.	855.0
3.	941.1
4.	748.3
S.E./mean	= 61.8 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53 (114).

Site :- Cotton Res. Stn., B.A. Farm, Rauni.

Type :- 'C'.

Object :—To determine the optimum sowing time and spacing for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Toria*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 plough and 4 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) 10 C.L. as F.Y.M. by broadcast. 42 lb./ac. of N as A/S applied by broadcast on 19.8.1953. (vi) F-216 (medium). (vii) Irrigated. (viii) 1-2 triphally. (ix) 22.73". (x) 4.10.1953 to 28.12.1953.

2. TREATMENTS :

Main-plot treatments :

6 dates of sowing : $D_1=1.4.1953$, $D_2=12.4.1953$, $D_3=24.4.1953$, $D_4=8.5.1953$, $D_5=24.5.1953$ and $D_6=4.6.1953$.

Sub-plot treatments :

2 spacings : $S_1=2' \times 1.25'$ and $S_2=2.5' \times 1.5'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot. (iii) 4. (iv) (a) $85' \times 15'$, (b) $77.79' \times 10'$. (v) One row on each side of sub-plot left as non-experimental area at the time of picking, 2' unsown buffer plot kept in between main-plots. (vi) Yes.

4. GENERAL :

(i) Germination on the whole good and satisfactory. No lodging. (ii) *Kuta* insect of *Toria* noticed on 9.4.1953. This effected germination of the seed. Effect of insect was 3" deep in soil. Dibbling of seed was also done in vacant spaces or spacing caused by pest attack on 23.4.1953. The effect of insect was severe in D_1 and D_2 plots. (iii) Germination/hill and yield of *kapas* (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) Cotton Res. Stn., Faridkot. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1357 lb./ac.
 (ii) (a) 273.8 lb./ac.
 (b) 158.7 lb./ac.
 (iii) D effect is highly significant. S effect is not significant while interaction $D \times S$ is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	D_4	D_5	D_6	Mean
S_1	1433	1489	1661	1744	1148	950	1404
S_2	1705	1546	1492	1514	941	664	1310
Mean	1568	1518	1577	1629	1045	807	1357

S.E. of difference of two

1. D marginal means = 136.9 lb./ac.
 2. S marginal means = 45.8 lb./ac.
 3. S means at the same level of D = 112.2 lb./ac.
 4. D means at the same level of S = 158.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(66).

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Type :- 'CV'.

Object :- To study the best sowing date for different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As under treatments. (iv) (a) 4 ploughings and 1 *sohaga* levelling. (b) N.A. (c) 10 Sr./ac. (d) $2\frac{1}{2}' \times 1\frac{1}{4}'$. (e) N.A. (v) 8 ton/ac. of F.Y.M. before sowing and 40 lb./ac. of N in A/S at flowering stage. (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings and 1 thinning. (ix) 7.44". (x) 6.10.1952 to 27.11.1952.

2. TREATMENTS :

Main-plot treatments :

5 dates of sowing : $D_1=21.4.1952$, $D_2=11.5.1952$, $D_3=21.5.1952$, $D_4=8.6.1952$ and $D_5=26.6.1952$.

Sub-plot treatments :

2 varieties : $V_1=L.S.S.$ (late) and $V_2=F-216$ (early).

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main $97' \times 30'$; Sub $97' \times 15'$. (b) Main $90\frac{1}{2}' \times 20'$; Sub $90\frac{1}{2}' \times 10'$. (v) Approximately 4' left out as non experimental area on both breadth side of the plot. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Dusted with B.H.C. spray on 7.5.1952. (iii) Height., boll no., boll weight and *kapas* yield. (iv) (a) No. (b) and (c) No. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 865 lb./ac.

(ii) (a) 282.5 lb./ac.

(b) 127.3 lb./ac.

(iii) Main-plot treatments effect is highly significant while others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	D_1	D_2	D_3	D_4	D_5	Mean
V_1	1086	1012	832	775	498	841
V_2	1119	1106	873	886	461	889
Mean	1103	1059	853	831	480	865

S.E. of difference of two

1. D marginal means = 141.3 lb./ac.
2. V marginal means = 40.3 lb./ac.
3. V means at the same level of D = 90.0 lb./ac.
4. D means at the same level of V = 154.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 48(6).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'CV'.

Object :- To study the best sowing date for Cotton varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) 30.62". (x) 17.10.1948 to 23.11.1948.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : $D_1=25.3.1948$, $D_2=18.4.1948$, $D_3=17.5.1948$ and $D_4=16.6.1948$.

Sub-plot treatments :

2 varieties : $V_1=231-R$ (medium) and $V_2=F-347$ (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/54.45th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948-50. (b) No (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 604.7 lb./ac.
 (ii) (a) 110.8 lb./ac.
 (b) 120.4 lb./ac
 (iii) All effects are highly significant.
 (iv) Av. yield of *kapas* in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	1134	1226	968	496	956
V ₂	419	300	168	126	253
Mean	777	763	568	311	605

S.E. of difference of two

1. D marginal means =45.2 lb./ac.
 2. V marginal means =34.8 lb./ac.
 3. V means at the same level of D =69.5 lb./ac.
 4. D means at the same level of V =66.8 lb./ac.

Crop :- Cotton (*Kharif*).

Site :- Govt. Agrl. Stn., Gurdaspur.

Ref :- Pb. 49(5).

Type :- 'CV'.

Object :-To study the best sowing date for Cotton varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 *raja* and 4 *desi* ploughings, 5 *sohaga* and 1 roller. (b) and (c) N.A. (d) 1.25' row to row. (e) N.A. (v) 10 C.L. of F.Y.M. on 26, 27.2.1949. (vi) As per treatments. (vii) Irrigated. (viii) One gap filling and 1 hoeing and weeding (ix) 18.55". (x) 14.9.1949 to 12.12.1949.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : D₁=12.3.1949, D₂=3.4.1949; D₃=14.5.1949 and D₄=11.6.1949.

Sub-plot treatments :

2 varieties : V₁=231-R (medium) and V₂=F-347 (medium).

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 1/45.37th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948—1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 688.3 lb./ac.
 (ii) (a) 99.3 lb./ac.
 (b) 136.5 lb./ac.
 (iii) All the effects are highly significant.

(iv) Av. yield of *kapas* in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	1169	1247	1044	382	960
V ₂	663	599	253	150	416
Mean	916	923	649	266	688

S.E. of difference of two

1. D marginal means =44.4 lb./ac.
2. V marginal means =43.2 lb./ac.
3. V means at the same level of D =86.3 lb./ac.
4. D means at the same level of V =75.5 lb./ac.

Crop :- Cotton (*Khairf*).

Ref :- Pb. 50(7).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'CV'.

Object :-To study the best date of sowing for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) As per treatments. (iv) (a) 6 ploughings with *desi* plough, 7 *sohaga* and 1 roller. (b) to (e) N.A. (v) 12 C.L. of F.Y.M. applied to whole field. (vi) As per treatments. (vii) Irrigated. (viii) One gapfilling and one weeding cum hoeing. (ix) 54.24". (x) 14.10.1950 to 13.12.1950.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : D₁=3.4.1950; D₂=8.5.1950, D₃=2.6.1950 and D₄=11.7.1950.

Sub-plot treatments :

2 varieties : V₁=R-231 and V₂=F-347.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) and (b) 80'-8" × 12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination satisfactory, growth normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1948-1950. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) Nil. (vii) Yield in D₄ main-plot failed totally and hence only 3 main-plots were considered in place of 4 main-plots.

5. RESULTS :

- (i) 431.8 lb./ac.
- (ii) (a) 71.8 lb./ac.
(b) 132.8 lb./ac.
- (iii) Both main-plot and sub-plot treatment effects are highly significant while interaction is not significant.
- (iv) Av. yield of *kapas* in lb./ac.

	D ₁	D ₂	D ₃	Mean
V ₁	695.4	671.1	468.6	611.7
V ₂	376.1	311.3	68.3	251.9
Mean	535.8	491.2	268.5	431.8

S.E. of difference of two

1. D marginal means =32.1 lb./ac.
2. V marginal means =48.5 lb./ac.
3. V means at the same level of D =84.0 lb./ac.
4. D means at the same level of V =67.5 lb./ac.

Crop :- Cotton.

Ref :- Pb. 49 (78).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CV'.

Object :- To find the best date of topping for Cotton crop,

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 4.4.1949. (iv) (a) One ploughing with *raja* plough, 1 *desi* plough, 5 *sohaga* and one horse hoe. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 5 hoeings, one thinning and one gapfilling. (ix) 26.99%. (x) F-216 : 8.9.1949 to 25.11.1949 and M 60 A₂ : 27.8.1949 to 25.10.1949.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=F-216 and V₂=M 60 A₂.

Sub-plot treatments :

4 dates of topping : D₁=1.6.1949, D₂=15.6.1949, D₃=30.6.1949 and D₄=15.7.1949.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 10' x 54'5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 673.5 lb./ac.

(ii) (a) 80.99 lb./ac.

(b) 96.43 lb./ac.

(iii) Main effect of V is highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	576.0	613.0	617.1	615.1	605.3
V ₂	752.9	755.0	732.3	726.2	741.6
Mean	664.5	684.0	674.7	670.7	673.5

S.E. of difference of two

1. V marginal means =25.61 lb./ac.

2. D marginal means =43.12 lb./ac.

3. D means at the same level of V =60.99 lb./ac.

4. V means at the same level of D =58.70 lb./ac.

Crop :- Cotton.

Ref :- Pb. 50 (91).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CV'.

Object :- To find the best date of topping for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) *Guara* (G.M.)—Cotton. (b) *Guara* (G.M.). (c) Nil. (ii) Loamy. (b) N.A. (iii) 9.4.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) 15.25%. (x) 23.9.1950 to 30.10.1950.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =F-216 and V_2 =M 60 A₂.

Sub-plot treatments :

4 dates of topping : D_0 =No topping, D_1 =15.6.1950, D_2 =30.6.1950 and D_3 =15.7.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949 to 1950. (b) No. (c)—. (v) (a) No. (b)—. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 796.4 lb./ac.
(ii) (a) 170.8 lb./ac.
(b) 133.1 lb./ac.
(iii) Main effect of V alone is significant.
(iv) Av. yield of *kapas* in lb./ac.

	D_0	D_1	D_2	D_3	Mean
V_1	964.8	946.3	925.7	792.0	907.2
V_2	668.6	683.0	711.8	678.9	685.6
Mean	816.7	814.6	818.8	735.5	796.4

S.E. of difference of two

1. V marginal means =54.0 lb./ac.
2. D marginal means =59.5 lb./ac.
3. D means at the same level of V =84.2 lb./ac.
4. V means at the same level of D =90.8 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., B.A. Farm, Rauni.

Ref :- Pb. 52(80).

Type :- 'CV'.

Object :-To study best sowing date for Cotton varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 8-10 sr./ac. (d) $2\frac{1}{2}' \times 1\frac{1}{2}'$. (e) N.A. (v) 66 lb./ac. of N as A/S (vi) As per treatments. (vii) Irrigated. (viii) One thinning and one weeding. (ix) 20.92%. (x) 6.11.1952, 25.11.1952, 17.12.1952 and 5.1.1953.

2. TREATMENTS :

Main-plot treatments :

5 dates of sowing : D_1 =15.4.1952, D_2 =1.5.1952, D_3 =15.5.1952, D_4 =1.6.1952 and D_5 =15.6.1952.

Sub-plot treatments :

2 varieties : V_1 =F-216 (early) and V_2 =L.S.S (late).

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot. (iii) 4. (iv) Sub-plot (a) $90' \times 15'$. (b) $83'-9'' \times 10'$. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Poor to Fair. No lodging. (ii) Jassid attack, BHC dusted as a control measure. (iii) *Kapas* yield. (iv) (a) No. (b)—. (c)—. (v) (a) Cotton Res. Stn., Faridkot. (b) Nil. (vi) Crop damaged due to heavy rains. (vii) Nil.

5. RESULTS:

- (i) 1445 lb./ac.
 (ii) (a) 129.8 lb./ac.
 (b) 96.3 lb./ac.
 (iii) Main-plot and sub-plot treatment effects are highly significant while interaction is not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	D ₁	D ₂	D ₃	D ₄	D ₅	Mean
V ₁	1491	1436	1432	1364	1115	1368
V ₂	1576	1643	1675	1498	1218	1522
Mean	1534	1539	1554	1431	1167	1445

S.E. of difference of two

1. D marginal means =64.9 lb./ac.
2. V marginal means =30.4 lb./ac.
3. V means at the same level of D =68.1 lb./ac.
4. D means at the same level of V =80.8 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., Abohar.

Ref :- Pb. 52(163).

Type :- 'CM'.

Object :- To study the effect of direct application of N and P₂O₅ to Cotton, with special reference to sowing date and spacing.

1. BASAL CONDITIONS:

(i) (a) Wheat Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320 (medium). (vii) Irrigated. (viii) One gap filling, one hoeing and one thinning. (ix) 5.45". (x) 5.11.1952 to 22.12.1952 (4 pickings).

2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 2 dates of sowing : D₁=21.5.1952 and D₂=12.6.1952.

(2) 2 spacings : S₁=2.5' × 1' and S₂=2.5' × 1.5'.

Sub-plot treatments:

3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.

Sub-sub-plot treatments:

2 levels of P₂O₅ : P₀=0 and P₁=50 lb./ac.

N applied as A/S and P₂O₅ as Super.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block ; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot (b) N.A. (iii) 4. (iv) (a) 60' × 15'. (b) 51' × 10'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, initiation of buds, boll weight and *kapas* yield. (iv) (a) 1952—contd. with modification. (b) No. (c)—. (v) (a) Jullundur and Hansi. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1861 lb./ac.
 (ii) (a) 361.1 lb./ac.
 (b) 423.5 lb./ac.
 (c) 223.0 lb./ac.
 (iii) Main-effect of N is highly significant. Main effects of D and S and interaction D×P are significant. Others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁	S ₁	S ₂
D ₁	1642	2049	2183	1958	2011	1905	2052	1864
D ₂	1417	1779	2096	1764	1703	1825	1880	1648
Mean	1529	1914	2140	1861	1857	1865	1966	1756
S ₁	1577	1954	2367	1966	1962	1971		
S ₂	1482	1874	1912	1756	1753	1759		
P ₀	1545	1898	2129	1857				
P ₂	1514	1930	2150	1865				

S.E. of difference of two

1. D or S marginal means = 73.7 lb./ac.
2. N marginal means = 105.9 lb./ac.
3. P marginal means = 45.5 lb./ac.
4. N means at the same level of D or S = 149.7 lb./ac.
5. D or S means at the same levels of N = 142.7 lb./ac.
6. P means at the same level of D or S = 64.4 lb./ac.
7. D or S means at the same level of P = 86.6 lb./ac.
8. P means at the same level of N = 78.8 lb./ac.
9. N means at the same level of P = 119.6 lb./ac.
10. means in the body of D×S table = 104.2 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., Abohar.

Ref :- Pb. 53(243).

Type :- 'CM'

Object :—To study the effect of N on Cotton with special reference to sowing dates and spacing.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) to (c) N.A. (v) N.A. (vi) F-320. (vii) Irrigated. (viii) 1 gap filling and 1 weeding. (ix) 7.87". (x) 25.10.1952 and early Nov. 1952.

2. TREATMENTS :

Main-plot treatments :

All combination of (1) and (2)

(1) 3 dates of sowing : D₁=1.5.1953, D₂=13.5.1953 and D₃=2.6.1953.(2) 3 spacings : S₁=2'×1', S₂=2'×1.5' and S₃=2'×2'.

Sub-plot treatments :

3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.

N as A/S applied near flowering time by spreading round the plant.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 Main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Main : 45'×56', Sub : 15'×56'. (b) Main : N.A., Sub : 10'×48'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Initiation of buds, boll weight and *kapas* yield. (iv) (a) 1952—contd. with modification. (b) and (c) No. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 657.7 lb./ac.
 (ii) (a) 151.98 lb./ac.
 (b) 120.63 lb./ac.
 (iii) Main effects of D and N are highly significant while others are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean	S ₁	S ₂	S ₃
D ₁	563.0	782.7	896.0	747.2	720.5	771.1	750.1
D ₂	465.7	609.2	735.6	603.5	643.7	626.2	540.6
D ₃	504.6	651.0	711.3	622.3	616.5	655.3	595.1
Mean	511.1	681.0	781.0	657.7	660.2	684.2	628.6
S ₁	493.0	690.8	796.8	660.2			
S ₂	563.0	705.9	783.7	684.2			
S ₃	477.4	646.1	762.3	628.6			

S.E. of difference of two

- D or S marginal means = 35.82 lb./ac.
- N marginal means = 28.43 lb./ac.
- N means at the same level of D or S = 49.25 lb./ac.
- D or S means at the same level of N = 53.85 lb./ac.
- means in body of D×S table = 62.05 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(103).

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Type :- 'CM'.

Object :—To study the effect of N on Cotton with reference to sowing time and spacing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 1 *hindustan* plough, 3 *desi* plough and 1 planking. (b) N.A. (c) 8-10 sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) F-320 (early). (vii) Irrigated. (viii) 2 hoeings, 2 weedings and 1 thinning. (ix) 21.75". (x) 13.11.1953 to 30.12.1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=20.4.1953, D₂=10.5.1953 and D₃=1.6.1953.

Sub-plot treatments :

3 levels of N as A/S : N₀=0, N₁=50 and N₂=100 lb./ac.

Sub-sub-plot treatments :

2 spacings : S₁=2'×1.25' and S₂=2.5'×1.5'.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot (b) N.A. (iii) 4. (iv) (a) Main : 99'×60' sub : 99'×20' sub-sub : 99'×10'. (b) Main : 90'-9"×60' sub : 90'-9"×20' sub-sub : 90'-9"×10'. (v) Approximately 4' on each side of the breadth of each plot. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) No. of bolls, plant height and *kapas* yield. (iv) (a) Not contd. (b) and (c) No. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni. (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1527 lb./ac.
 (ii) (a) 252.9 lb./ac.
 (b) 172.4 lb./ac.
 (c) 204.8 lb./ac.
 (iii) Main effect of S alone is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean	S ₁	S ₂
D ₁	1475	1682	1600	1586	1649	1522
D ₂	1354	1671	1727	1584	1604	1564
D ₃	1299	1444	1493	1412	1489	1335
Mean	1376	1599	1607	1527	1581	1474
S ₁	1463	1611	1669	1581		
S ₂	1290	1587	1544	1474		

S.E. of difference of two

1. D marginal means = 73.0 lb./ac.
2. N marginal means = 49.8 lb./ac.
3. S marginal means = 48.2 lb./ac.
4. N means at the same level of D = 86.2 lb./ac.
5. D means at the same level of N = 101.4 lb./ac.
6. S means at the same level of D = 83.6 lb./ac.
7. D means at the same level of S = 94.0 lb./ac.
8. S means at the same level of N = 83.6 lb./ac.
9. N means at the same level of S = 77.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(3).

Site :- Cotton Res. Stn., Hansi.

Type :- 'CM'.

Object:--To study the effect of application of N and P₂O₅ to Cotton crop with special reference to different dates of sowing and spacing.

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton-Wheat. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 30.4.1952 and 15.5.1952. (iv) 4 *desi* plough. (b) Dibbling. (c) 10 to 15 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216. (vii) Irrigated. (viii) 2 thinnings, 3 hoeings and 1 weeding. (ix) 12.37". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 dates of sowing : D₁=End of April and D₂=Middle of May.(2) 2 spacings : S₁=2'×2' and S₂=2'×1.5'.

Sub-plot treatments :

3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.

Sub-sub-plot treatments :

2 levels of P₂O₅ : P₀=0 and P₁=50 lb./ac.N applied as A/S and P₂O₅ as Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 3 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) 55'×98'. (iii) 4. (iv) (a) 75'×14'. (b) 66'×10'. (v) 2 row and 3 plants left out as border. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) N.A. (iii) Height, distributions of bolls, dry weight of plant, no. of seeds/boll and *kapas* yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 909 lb./ac.

(ii) (a) 343.60 lb./ac.

(b) 154.12 lb./ac.

(c) 72.82 lb./ac.

(iii) Main effect of N is highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean	P ₀	P ₁	S ₁	S ₂
D ₁	640	886	1216	914	909	920	890	939
D ₂	648	910	1152	903	884	922	929	877
Mean	644	898	1184	909	896	921	909	908
S ₁	622	919	1187	909	891	928		
S ₂	667	877	1180	908	902	914		
P ₀	638	883	1167	896				
P ₁	650	912	1201	921				

S.E. of difference of two

1. D or S marginal means =70.13 lb./ac.
2. N marginal means =38.54 lb./ac.
3. P marginal means =14.86 lb./ac.
4. N means at the same level of D or S =54.49 lb./ac.
5. D or S means at the same level of N =83.06 lb./ac.
6. P means at the same level of D or S =21.02 lb./ac.
7. D or S means at the same level of P =71.70 lb./ac.
8. P means at the same level of N =25.74 lb./ac.
9. N means at the same level of P =42.62 lb./ac.
10. means in body of table D × S =99.21 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., Hansi.

Ref :- Pb. 53 (2).

Type :- 'CM'.

Object :- To study the effect of N on Cotton with special reference to sowing dates and spacing.

1. BASAL CONDITIONS:

(i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 *desi* plough and 4 *sohaga*. (b) dibbling. (c) 12 sr./ac. (d) As per treatments. (e) N.A. (vi) F-216. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 4.56'. (x) 10.11.1953 to 18.12.1953.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 3 dates of sowing: D₁=20.4.1953, D₂=10.5.1953 and D₃=30.5.1953.

(2) 3 spacings: S₁=2' × 1', S₂=2' × 1.5' and S₃=2' × 2'.

Sub-plot treatments:

3 levels of N: N₀=0, N₁=50 and N₂=100 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 16'×44' (v) 1 row left out on each side of the plot. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Plant height and *kapas* yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 942 lb./ac.
 (ii) (a) 494.5 lb./ac.
 (b) 168.9 lb./ac.
 (iii) Sub-plot treatment effect is highly significant. Others are not significant
 (iv) Av. yield of *kapas* in lb./ac.

	S ₁	S ₂	S ₃	Mean	N ₀	N ₁	N ₂
D ₁	1017	900	843	921	648	967	1147
D ₂	1182	999	883	1022	783	1073	1209
D ₃	1087	707	850	882	725	937	983
Mean	1096	869	859	942	719	922	1113
N ₀	822	666	668	719			
N ₁	1138	908	930	992			
N ₂	1327	1032	979	1113			

S.E. of difference of two

1. D or S marginal means = 116.5 lb./ac.
2. N marginal means = 39.7 lb./ac.
3. N means at the same level of D or S = 68.9 lb./ac.
4. D or S means at the same level of N = 129.4 lb./ac.
5. means in body of D×S table = 201.9 lb./ac.

Crop :- Cotton.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 48(50).

Type :- 'C M'.

Object :- To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) loam. (b) N.A. (iii) 25.4.1948. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) M 60 A₂ (medium). (vii) Irrigated. (viii) One gap filling and 2 hoeings. (ix) 17.46". (x) 6 pickings from 17.9.1948 to 10.11.1948.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 spacings : S₁=1' and S₂=2'.

(2) 3 levels of N : N₀=0, N₁=50, and N₂=100 lb./ac.

A/S and Ammo. Phos. in ratio 3 : 2 applied on 12.7.1948.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 14'×79'. (b) 12'×72.6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1277 lb./ac.
 (ii) 134.1 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean
S ₁	1188	1250	1406	1281
S ₂	1026	1192	1601	1273
Mean	1107	1221	1503	1277

S.E. of marginal mean of S = 38.7 lb./ac.
 S.E. of marginal mean of N = 47.4 lb./ac.
 S.E. of body of table = 67.1 lb./ac.

Crop :- Cotton.

Ref :- Pb. 48(51).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CM'.

Object :—To study effect of date of sowing, spacing and manure on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.46". (x) 28.9.1948 to 22.11.1948.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=21.4.1948, D₂=12.5.1948 and D₃=9.6.1948.

Sub-plot treatments :

3 spacings : S₁=1.5', S₂=2' and S₃=2.5'.

Sub-sub-plot treatments :

2 levels of N as A/S : N₀=0 and N₁=50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1019 lb./ac.
 (ii) (a) 722.6 lb./ac.
 (b) 181.6 lb./ac.
 (c) 250.5 lb./ac.
 (iii) Main effect of N is highly significant. Main effect of D is significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	S ₁	S ₂	S ₃	Mean	N ₀	N ₁
D ₁	1464	1599	1593	1552	1385	1719
D ₂	863	994	830	896	817	975
D ₃	583	576	671	610	564	656
Mean	970	1056	1031	1019	922	1117
N ₀	909	949	908	922		
N ₁	1032	1163	1155	1117		

S.E. of difference of two

1. D marginal means = 208.6 lb./ac.
2. S marginal means = 52.5 lb./ac.
3. N marginal means = 59.0 lb./ac.
4. S means at the same level of D = 90.8 lb./ac.
5. D means at the same level of S = 221.4 lb./ac.
6. N means at the same level of D = 102.3 lb./ac.
7. D means at the same level of N = 220.8 lb./ac.
8. N means at the same level of S = 89.3 lb./ac.
9. S means at the same level of N = 102.3 lb./ac.

Crop :- Cotton.

Ref :- Pb. 49 (81).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CM'.

Object :—To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Loamy. (b) N.A. (iii) 6.4.1949. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) F-216 (medium). (vii) Irrigated. (viii) 1 gap filling and 3 hoeings. (ix) 26.99%. (x) 6.9.11.1949 to 27.11.1949 (4 pickings).

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 spacings : S₁=1.5' and S₂=2'.
- (2) 3 levels of N as A/S : N₀=0, N₁=50 and N₂=100 lb./ac.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1334 lb./ac.
- (ii) 116.4 lb./ac.
- (iii) Main effect of N is highly significant. Others are not significant.
- (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean
S ₁	1203	1452	1477	1377
S ₂	1165	1333	1373	1290
Mean	1184	1393	1425	1334

- S.E. of marginal mean of S = 33.6 lb./ac.
 S.E. of marginal mean of N = 41.1 lb./ac.
 S.E. of body of table = 58.2 lb./ac.

Crop :- Cotton.

Ref :- Pb. 50 (85).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CM'.

Object :—To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 15.4.1950. (iv) (a) 7 *desi* plough, 2 horse hoe and 6 *sohaga*. (b) N.A. (c) 15 to 20 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 15.25". (x) 12.79.1950 to 6.11.1950.

2. TREATMENTS :

All combination of (1) and (2)

(1) 2 spacings : $S_1=1.5'$ and $S_2=2'$.(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

N applied as A/S and Ammo. Phos. in 3 : 2 ratio.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $12' \times 74'$. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1260 lb./ac.

(ii) 116.9 lb./ac.

(iii) Main effect of N is highly significant. Main effect of S is significant. Interaction NS is not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
S_1	879	1386	1692	1319
S_2	828	1268	1507	1201
Mean	854	1327	1600	1260

S.E. of marginal mean of N = 41.3 lb./ac.

S.E. of marginal mean of S = 33.8 lb./ac.

S.E. of body of table = 58.5 lb./ac.

Crop :- Cotton.

Ref :- Pb. 51(25).

Site :- Govt. Agri. Stn., Karnal.

Type :- 'CM'.

Object :—To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.4.1951. (iv) (a) 5 *desi* plough and 7 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) One gap filling, 2 hoeings and weeding. (ix) 2.80". (x) 20.9.1951, 6.10.1951, 16.10.1951, 25.10.1951, 5.11.1951 and 23.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings : $S_1=1.5'$ and $S_2=2'$.(2) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

N as A/S and Ammo. Phos. mixture applied on 7.8.1951.

3. DESIGN

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 12'×70'. (v) Nil. (vi) Yes.

4. GENERAL

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1634 lb./ac.
 (ii) 207.3 lb./ac.
 (iii) Main effect of N is highly significant. Main effect of S, is significant while interaction NS is not significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean.
S ₁	1431	1481	2279	1730
S ₂	1210	1579	1826	1538
Mean	1321	1530	2052	1634

S.E. of marginal mean of N = 73.3 lb./ac.
 S.E. of marginal mean of S = 59.8 lb./ac.
 S.E. of body of table = 103.7 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(101).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'CM'.

Object :—To study the effect of spacing and manuring on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 50 lb./ac. of N as A/S in January, 1952. (ii) (a) Loam. (b) N.A. (iii) 8.4.1952. (iv) (a) 2 *desi* plough, 3 *sohaga* and 2 roller. (b) N.A. (c) 12 sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 gap fillings, 4 hoeings and one thinning. (ix) 14.66". (x) 29.9.1952 to 20.11.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 spacings : S₁=1.5' and S₂=2'.

(2) 3 levels of N as mixture of A/S and Ammo. Phos. : N₀=0, N₁=50 and N₂=100 lb./ac.

3. DESIGN :

(i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12'×78.5'. (b) 12'×66'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- i) 2013 lb./ac.
 (ii) 167.4 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean
S ₁	2014	1955	2196	2055
S ₂	1798	2077	2040	1972
Mean	1906	2016	2118	2013

S.E. of marginal mean of N = 59.2 lb./ac.
 S.E. of marginal mean of S = 48.3 lb./ac.
 S.E. of body of table = 83.7 lb./ac.

Crop :- Cotton.

Res :- Pb. 53(1).

Site :- Cotton Res. Stn., Hansi.

Type :- 'CM'.

Object :- To study the effect of application of N and P_2O_5 to Cotton crop.

1. BASAL CONDITIONS :

(i) (a) and (b) As per treatments. (c) Nil. (ii) (a) Light loam. (b) N.A. (iii) 24.4.1953. (iv) (a) 4 ploughings with *desi* plough. (b) Dibbling. (c) 12 sr./ac. (d) and (e) N.A. (v) No. (vi) F-216. (vii) Irrigated. (viii) 2 weedings and 2 hosings. (ix) 4.56". (x) 2.12.1953 to 1.1.1954.

2. TREATMENTS :

Main-plot treatments :

5 rotations of crops : R_1 = Wheat—Guara—Cotton, R_2 = Wheat—Gram—Cotton, R_3 = Wheat—Berseem—Cotton, R_4 = Wheat—Wheat—Cotton and R_5 = Wheat—Fallow—Cotton.

Sub-plot treatments :

2 levels of P_2O_5 : $P_0=0$ and $P_1=25$ lb./ac.

Sub-sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.N applied as A/S. P_2O_5 as Super applied 5" deep with pore behind the plough.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8' x 46'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Stand of crop good. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1952—contd. with modifications. (b) and (c) No. (v) (a) Jullundur and Abohar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1850 lb./ac.
(ii) (a) 900.7 lb./ac.
(b) 491.6 lb./ac.
(c) 589.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	P_0	P_1
R_1	2136	1705	1817	1886	1865	1907
R_2	1839	1859	2190	1963	1933	1992
R_3	1951	1992	1880	1941	1987	1895
R_4	2102	1453	1775	1777	1811	1742
R_5	1377	1424	2245	1682	1612	1752
Mean	1881	1687	1981	1850	1841	1858
P_0	1859	1661	2004	1841		
P_1	1902	1712	1959	1858		

S.E. of difference of two

1. R marginal means = 260.0 lb./ac.
2. P marginal means = 89.8 lb./ac.
3. N marginal means = 131.8 lb./ac.
4. P means at the same level of R = 200.7 lb./ac.
5. R means at the same level of P = 232.2 lb./ac.
6. N means at the same level of R = 294.7 lb./ac.
7. R means at the same level of N = 302.8 lb./ac.
8. N means at the same level of P = 186.4 lb./ac.
9. P means at the same level of N = 164.9 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(116).

Site :- Cotton Res. Stn , B.A. Farm, Rauni.

Type :- 'CM'.

Object :-To study the effect of N along with spacings and dates of sowing.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 6 ploughings and 5 *sohaga* levellings. (b) N.A. (c) 8 to 10 sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) F-320 (early). (vii) Irrigated. (viii) N.A. (ix) 22.73°. (x) 30,31.10.1953 and 4.12.1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=20.4.1953$, $D_2=10.5.1953$ and $D_3=1.6.1953$.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.(2) 2 spacings : $S_1=2' \times 1.25'$ and $S_2=2.5' \times 1.5'$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/33 ac. (b) 1/56 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Stick weight and *kapas* yield. (iv) (a) 1953-54. (b) and (c) No (v) (a) Cotton Res. Stn., M.A. Farm, Faridkot. (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1163 lb./ac.

(ii) (a) 258.2 lb./ac.

(b) 160.6 lb./ac.

(iii) Main-plot and sub-plot treatment effects are highly significant while interaction is not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean	S_1	S_2
D_1	1225	1527	1489	1414	1435	1392
D_2	1135	1339	1471	1315	1355	1276
D_3	696	777	810	761	818	703
Mean	1019	1214	1257	1163	1203	1124
S_1	1062	1264	1283	1203		
S_2	975	1165	1231	1124		

S.E. of difference of two

1. D marginal means =74.5 lb./ac
2. N marginal means =37.9 lb./ac.
3. S marginal means =46.4 lb./ac.
4. N means at the same level of D =80.2 lb./ac.
5. D means at the same level of N =99.3 lb./ac.
6. S means at the same level of D =65.6 lb./ac.
7. D means at the same level of S =87.8 lb./ac.
8. means in body of $N \times S$ table =65.6 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(70).

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Type :- 'I'.

Object : To study whether late irrigation to L.S.S. variety can be dispensed with or not.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 3.6.1952. (iv) (a) to (e) N.A. (v) 8 ton/ac. of F.Y.M. before sowing 50 lb./ac. of N as A/S to replication II, IV and V on 18.8.1952 and 25 lb./ac. of N as A/S to replication I and III on 1.8.1952. (vi) L.S.S. (late). (vii) Irrigated. (viii) 1 thinning, 2 hoeings and 1 weeding. (ix) 7.44". (x) 10.11.1952 to 26.12.1952.

2. TREATMENTS:

1. Irrigation upto Sept. (Control).
2. One additional irrigation in Oct.
3. Two additional irrigation, one in Oct. and one in Nov.

3. DESIGN :

(i) R B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) No lodging. Poor to satisfactory. (ii) Nil. (iii) Plant height and *kapas* yield. (iv) (a) No. (b) —. (c) —. (v) a No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 840.3 lb./ac.
 (ii) 87.30 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
1.	860.9
2.	819.8
3.	840.3
S.E./mean	=39.04 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(67).

Site :- Cotton. Res. Stn., M.A. Farm, Faridkot.

Type :- 'IV'.

Object :—To study the effect of irrigations on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 13,14.5.1952. (iv) (a) 3 ploughings and one *sohaga*. (b) N.A. (c) 8-10 sr./ac. (d) 2.5'×1.25'. (e) N.A. (v) 8 ton/ac. of F.Y.M. before sowing and 40 lb./ac. of N as A/S on 2.8.1952, (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings, 1 weeding and 2 thinnings. (ix) 7.44". (x) 21.10.1952 to 2.1.1953.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : $I_1=3$, $I_2=4$ and $I_3=5$ irrigations.

Sub-plot treatments :

2 varieties : $V_1=L.S.S.$ (late) and $V_2=F-216$. (early).

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 99'×10'. (b) 90'—9"×10'. (v) Approx. 4' left as non experimental area on both sides of breadth. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Boll no., boll weight, plant height and *kapas* yield. (iv) (a) No. (b) —. (c) —. (v) (a) Cotton Res. Stn., B.A. Farm, Rauni (vi) and (vii) Nil.

5. RESULTS ;

- (i) 1194 lb./ac.
 (ii) (a) 260.8 lb./ac.
 (b) 127.3 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	V ₁	V ₂	Mean
I ₁	1109	878	993
I ₂	1265	1254	1260
I ₃	1311	1348	1330
Mean	1228	1160	1194

S.E. of difference of two

1. I marginal means = 130.4 lb./ac.
2. V marginal means = 52.0 lb./ac.
3. V means at the same level of I = 90.0 lb./ac.
4. I means at the same level of V = 145.1 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(81).

Site :- Cotton Res. Stn., B.A. Farm, Rauni.

Type :- 'IV'.

Object :- To study the effect of irrigation on different varieties of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 24.5.1952. (iv) (a) and (b) N.A. (c) 8-10 sr./ac. (d) and (e) N.A. (v) 70 lb./ac. of N as A/S. (vi) As per treatments. (vii) Irrigated (viii) 1 hoeing, 2 weedings and one thinning. (ix) 20.92". (x) 15.11.1952 to 3.1.1953.

TREATMENTS :

Main-plot treatments :

3 levels of irrigation : I₁=3, I₂=4 and I₃=5 irrigations.

Sub-plot treatments :

2 varieties : V₁=L.S.S. and V₂=F-216.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15'×88'. (b) 10'×80'-8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) and (c) —. (v) (a) Cotton Res. Stn., M.A. Farm, Faridkot. (b) —. (vi) Crop damaged due to heavy rains. (vii) Nil.

5. RESULTS :

- (i) 1254 lb./ac.
 (ii) (a) 244.5 lb./ac.
 (b) 204.9 lb./ac.
 (iii) Main effect of V is highly significant, interaction I×V is significant while I is not significant.

(iv) Av. yield of *kapas* in lb./ac.

	V ₁	V ₂	Mean
I ₁	1147	1192	1170
I ₂	1385	1059	1222
I ₃	1554	1187	1371
Mean	1362	1146	1254

S.E. of difference of two

1. I marginal means = 99.8 lb./ac.
2. V marginal means = 68.3 lb./ac.
3. V means at the same level of I = 118.3 lb./ac.
4. I means at the same level of V = 130.3 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Ref :- Pb. 52(69).

Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 24.5.1952. (iv) (a) 3 ploughings and one *sohaga*. (b) N.A. (c) 8-10 sr./ac. (d) 2.5' × 1.25'. (e) N.A. (v) Nil. (vi) F-216. (early). (vii) Irrigated. (viii) 3 hoeings. (ix) 7.44". (x) 9.10.1952, 2.11.1952 and 26.11.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of irrigations : I₁=3, I₂=4 and I₃=5 irrigations.(2) 3 levels of N as A/S : N₀=0, N₁=40 and N₂=80 lb./ac.

Half dose of N applied on 28.7.1952 and the other half on 10.8.1952.

3. DESIGN :

(i) 3 × 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 99' × 10'. (b) 90'-9" × 10'. (v) Approx. 4 on both sides of breadth left as border. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) To combat Jassid attack 20 lb. of BHC dusted on 3.8.1952. (iii) Boll no./ plant, boll weight, height of plant and *kapas* yield. (iv) (a) 1952—continued with modification. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1282 lb./ac.

(ii) 128.4 lb./ac.

(iii) Main effect of I is highly significant, interaction I × N is significant while N is not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean
I ₁	1060	1160	1294	1171
I ₂	1327	1373	1165	1288
I ₃	1301	1379	1480	1387
Mean	1229	1304	1313	1282

S.E. of marginal means of I or N = 37.1 lb./ac.

S.E. of body of table = 64.2 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(105).

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 28.5.1953 to 31.5.1953. (iv) (a) 1 *hindustan* plough, 4 *desi* plough and 1 *sohaga*. (b) and (c) N.A. (d) 2.5' × 1.25'. (e) N.A. (v) Nil. (vi) F-320 (early). (vii) Irrigated. (viii) N.A. (ix) 21.75". (x) 7.11.1953 to 11.2.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of irrigation : $I_1=3$, $I_2=5$ and $I_3=7$ irrigations.(2) 3 levels of N as A/S : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

Half the dose of N applied from 4.7.1952 to 10.7.1953 and the other half on 13.8.1953.

3. DESIGN :

(i) 3 × 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 99' × 15'. (b) 83-9" × 10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Height of plant, boll weight, no. of bolls/plant and *kapas* yield. (iv) (a) 1952—1953, after 1953 continued with modification. (b) No. (c) Nil. (v) (a) No (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1715 lb./ac.

(ii) 130.7 lb./ac.

(iii) Main effect of N is highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N_0	N_1	N_2	Mean
I_1	1611	1770	1714	1698
I_2	1590	1727	1869	1729
I_3	1576	1646	1931	1718
Mean	1592	1714	1838	1715

S.E. of marginal means = 37.7 lb./ac.
S.E. of body of table = 65.4 lb./ac.

Crop :- Cotton (*Kharif*).

Ref :- 52(71).(Expt. on cultivator's field).

Site :- Faridkot, Distt. Bhatinda.

Type :- 'IM'.

Object :- To study the effect of irrigation and manure on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) Light loam. (iii) 6 ton/ac. of F.Y.M. before sowing. (iv) L.S.S. (medium). (v) (a) to (e) N.A. (vi) 20.5.1952. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 3 pickings.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : $I_1=3$, $I_2=4$ and $I_3=5$ irrigations.

Sub-plot treatments :

3 levels of N : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.

N as A/S applied at flowering stage.

3. DESIGN :

(i) and (ii) Split-plot. 3 main-plots/block ; 3 sub-plots/main-plot. (iii) (a) and (b) 1/60 ac. (iv) Y₂.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) *Kapas* yield. (iv) (a) No. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1164 lb./ac.
 (ii) (a) 146.6 lb./ac.
 (b) 110.5 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	Mean
I ₁	1184	1097	1070	1117
I ₂	1173	1117	1188	1159
I ₃	1213	1213	1225	1217
Mean	1190	1142	1161	1164

S.E. of difference of two

1. I marginal means =59.8 lb./ac.
2. N marginal means =45.1 lb./ac.
3. N means at the same level of I =78.1 lb./ac.
4. I means at the same level of N =87.5 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53 (104).

Site :- Cotton Res. Stn., M.A. Farm, Faridkot.

Type :- 'I C'.

Object :- To study the effect of irrigation and spacing on yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton-Oats-Cotton. (b) Oats. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) 29.4.1953. (iv) (a) 5 plough and 2 *sohaga*. (b) N.A. (c) 8-10. sr./ac. (d) As per treatments. (e) N.A. (v) 16 tons of F.Y.M./ac. from 4.4.1953 to 6.4.1953 by broadcast. 25 lb./ac. of N as A/S in the end of June. (vi) F-320 (early). (vii) Irrigated. (viii) Two hoeings and one thinning. (ix) 21.75". (x) 9.11.1953. 5.12.1953 and 25.12.1953.

2. TREATMENTS :

Main-plot treatments :

5 levels of irrigation : I₁=2, I₂=3, I₃=4, I₄=5 and I₅=6 irrigations.

Sub-plot treatments :

2 spacings : S₁=2'×1.25' and S₂=2.5'×1.5'.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main plot (b) N.A. (iii) 4. (iv) (a) 20'×49.5'. (b) 20'×45'-4.5". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) DDT sprayed on 11.9.1953 against Jassid attack. (iii) Boll weight, boll no., height of plant and *kapas* yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1668 lb./ac.
 (ii) (a) 165.3 lb./ac.
 (b) 147.8 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of *kapas* in lb./ac.

	I ₁	I ₂	I ₃	I ₄	I ₅	Mean
S ₁	1549	1612	1719	1625	1697	1640
S ₂	1549	1733	1679	1765	1751	1695
Mean	1549	1673	1699	1695	1724	1668

S.E. of difference of two

1. I marginal means = 82.6 lb./ac.
 2. S marginal means = 46.7 lb./ac.
 3. S means at the same level of I = 104.5 lb./ac.
 4. I means at the same level of S = 110.8 lb./ac.

Crop :- Cotton.

Site :- Cotton Res. Stn., Abohar.

Ref :- Pb. 52 (160).

Type :- 'CIM'.

Object:—To study the effect of graded doses of N, with special reference to irrigation and spacing, on Cotton crop.

1. BASAL CONDITIONS :

- (i) (a) Wheat-Cotton. (b) Wheat. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 22.5.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) F-320. (vii) Irrigated. (viii) 2 gap fillings, 4 hoeings and 2 thinning. (ix) 5.45". (x) 31.10.1952 to 18.12.1952.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

- (1) 2 levels of irrigation : I₁=Light and I₂=Heavy irrigation.
 (2) 2 spacings : S₁=2.5' × 1.25' and S₂=2.5' × 2'.

Sub-plot treatments :

6 levels of N : N₀=0, N₁=25, N₂=50, N₃=75, N₄=100 and N₅=125 lb./ac.
 N applied in two equal doses, first before sowing and the second immediately after the outset of flowering.

3. DESIGN :

- (i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) main-plot : 60' × 95', sub-plot : 60' × 15'. (b) main-plot : N.A., sub-plot : 50' × 10'. (v) N.A. (vi) Yes

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Height, initiation of buds, boll weight and *kapas* yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) Jullundur and Hansi. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2332 lb./ac.
 (ii) (a) 620.8 lb./ac.
 (b) 260.2 lb./ac.
 (iii) Main effect of N and interaction I × S × N are highly significant, interaction S × N is significant while others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	N ₅	Mean	S ₁	S ₂
I ₁	2131	2366	2369	2373	2354	2442	2339	2479	2199
I ₂	2065	2123	2356	2312	2481	2610	2325	2290	2359
Mean	2098	2245	2363	2343	2417	2526	2332	2385	2279
S ₁	2314	2309	2355	2490	2365	2474	2385		
S ₂	1882	2180	2370	2195	2470	2578	2279		

S.E. of difference of two

1. I or S marginal means = 126.7 lb./ac.
2. N marginal means = 92.1 lb./ac.
3. N means at the same level of I or S = 130.1 lb./ac.
4. I or S means at the same level of N = 173.7 lb./ac.
5. means in body of I×S table = 179.2 lb./ac.

Crop :- Cotton.

Ref :- Pb. 52(4).

Site :- Cotton Res. Stn., Hansi.

Type :- 'CIM'.

Object :—To study the effect of graded doses of N with special reference to irrigation and spacing.

1. BASAL CONDITIONS :

(i) (a) Wheat-Cotton-Wheat. (b) Wheat, (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 4.5.1952. (iv) (a) 4 ploughings with *desi* plough. (b) Dibbling by hand. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) F-216 (early). (vii) Irrigated. (viii) 1 weeding, 1 hoeing and one thinning. (ix) 12.37%. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of irrigation : I₁=Light and I₂=Heavy irrigation.(2) 2 spacings : S₁=2'×1.5' and S₂=2'×2'.

Sub-plot treatments :

6 levels of N as A/S : N₀=0, N₁=25, N₂=50, N₃=75, N₄=100 and N₅=125 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots/main-plot. (b) 198'×105'. (iii) 4. (iv) (a) 14'×50'. (b) 10'×40'. (v) 2 rows left as border. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height, distribution of bolls, distribution of nodes, dry weight of plant, lint index, stand, seed index, no. of seeds/boll and *kapas* yield. (iv) (a) No. (b)—. (c)—. (v) (a) Jullundur and Abohar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 1114 lb./ac.

(ii) (a) 283.1 lb./ac.

(b) 144.4 lb./ac.

(iii) Main effect of N is highly significant. Others are not significant.

(iv) Av. yield of *kapas* in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	N ₅	Mean	S ₁	S ₂
I ₁	704	846	1092	1143	1362	1475	1104	1195	1113
I ₂	663	822	983	1209	1434	1628	1123	1094	1152
Mean	684	834	1038	1176	1398	1552	1114	1094	1133
S ₁	686	785	1018	1133	1375	1568	1094		
S ₂	681	882	1057	1219	1422	1535	1133		

S.E. of difference of two

1. I or S marginal means = 57.8 lb./ac.
2. N marginal means = 51.1 lb./ac.
3. N means at the same level of I or S = 72.2 lb./ac.
4. I or S means at the same level of N = 87.7 lb./ac.
5. means in the body of I×S table = 81.7 lb./ac.

Crop :- Cotton.

Ref :- Pb. 53(115).

Site :- Cotton Res. Stn. B.A. Farm, Rauni.

Type :- 'D'.

Object :- To study the effect of presowing treatment of seed on the development and yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18.5.1953. (iv) (a) N.A. (b) N.A. (c) 8-10 sr./ac. (d) 2.5'×1.25'. (e) N.A. (v) 50 lb./ac. of N as A/S applied on 20.7.1953 by broadcast. (vi) F-216 (medium). (vii) Irrigated. (viii) 2 hoeings. (ix) 22.73°. (x) 6.10.1953, 23.10.1953 and 14.12.1953.

2. TREATMENTS :

T₁=Unsoaked seeds.
 T₂=Seeds treated with Perenox.
 T₃=Seeds soaked in water for 24 hours.
 T₄=Seeds treated with molar solution of A/S for 24 hours.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 15'×57'. (b) 10'×43.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination poor. No lodging. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1034 lb./ac.
 (ii) 222.0 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of *kapas* in lb./ac.

Treatment	Av. yield
T ₁	895
T ₂	1204
T ₃	1106
T ₄	930
S.E./mean	=111.0 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49(44).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To study the effect of different forms of N with and without Pot. Sul.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26, 27.3.1949. (iv) (a) 5 ploughings and 7 *sohaga*. (b) N.A. (c) 3/4 oz./*marla*. (d) Plant to plant 1'. row to row 2'. (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6 toppings, 7 suckering and 4-5 hoeings. (ix) 5.87". (x) 27.7.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac.

(2) 4 sources of N : $N_1=F.Y.M.$ at 100 lb./ac. of N applied on 25.3.1949, $N_2=A/S$ at 100 lb./ac. of N on 2.5.1949 and 15.5.1949, $N_3=Pot. Nit.$ at 100 lb./ac. of N applied on 2.5.1949, and 15.5.1949, and $N_4=Ammono. Phos.$ at 100 lb./ac. of N applied on 2.5.1949 and 15.5.1949.

3. DESIGN :

(i) 2x4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 55'x10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tobacco yield (iv) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1529 lb./ac.

(ii) 146.9 lb./ac.

(iii) N effect is highly significant, K is significant while interaction is not significant.

(iv) Av. yield of tobacco in lb./ac.

	K_0	K_1	Mean
N_1	1236	1239	1238
N_2	1639	1460	1550
N_3	1684	1633	1659
N_4	1775	1561	1668
Mean	1584	1473	1529

S.E. of marginal mean of N =42.4 lb./ac.

S.E. of marginal mean of K =30.0 lb./ac.

S.E. of body of table =60.0 lb./ac.

Crop :- Tobacco

Ref :- Pb. 50(40).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To study the effect of different forms of N with and without Pot. Sul.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22,23.2.1950. (iv) (a) 6 ploughings and 8 *sohaga* (b) N.A. (c) 1/2 oz./*marla* (d) 15"x9". (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19". (x) 16.6.1950 to 24.6.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac.

(2) 4 sources of N : $N_1=F.Y.M.$ at 100 lb./ac. of N, $N_2=A/S$ at 100 lb./ac. of N, $N_3=Pot. Nit.$ at 100 lb./ac. of N and $N_4=Ammono. Phos.$ at 100 lb./ac. of N.

3. DESIGN :

(i) 2×4 Fact. in R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 55'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, stand and rope weight (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1600 lb./ac.
 (ii) 231.8 lb./ac.
 (iii) N effect is highly significant, while K effect and interaction N×K are not significant.
 (iv) Av. yield of tobacco in lb./ac.

	K ₀	K ₁	Mean
N ₁	1337	1331	1334
N ₂	1567	1611	1589
N ₃	1840	1568	1704
N ₄	1808	1736	1772
Mean	1638	1562	1600

S.E. of marginal mean of N =66.9 lb./ac.
 S.E. of marginal mean of K =47.3 lb./ac.
 S.E. of body of table =94.6 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozpur Cantt.

Ref :- Pb. 51 (7).

Type :- 'M'.

Object:—To study the effect of different forms of N with and without Pot. Sul.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1951. (iv) (a) 1 ploughing with *raja* plough, 5 *desi* ploughings, 2 rollers and 4 *sohaga*. (b) and (c) N.A. (d) 1'×1½'. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. on 15, 16.1.1951. (vi) T-21 (medium). (vii) Irrigated. (viii) One hoeing. (ix) 0.91". (x) 16.6.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of K₂O : K₀=0 and K₁=50 lb./ac.

(2) 4 sources of N : N₁=F.Y.M. at 100 lb./ac. of N, N₂=A/S at 100 lb./ac. of N, N₃=Pot. Nit. at 100 lb./ac. of N and N₄=Ammono. Phos. at 100 lb./ac. of N.

F.Y.M. applied on 15.1.1951 ; Pot. Sul. applied on 16.1.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 55'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) (a) Normal. No lodging. (ii) Nil. (iii) Dry wt. pit wt. of stalk and ropes, wt. of green leaves, no. of leaves, length and breadth of leaves in cm., height in cm., no of plants at harvest and tobacco yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 768.3 lb./ac.
 (ii) 170.79 lb./ac.
 (iii) Main-effect of N alone is highly significant.

(iv) Av. yield of tobacco in lb./ac.

	K ₀	K ₁	Mean
N ₁	454.0	350.5	402.3
N ₂	720.4	781.5	751.0
N ₃	813.8	900.3	857.1
N ₄	1057.3	1068.4	1062.9
Mean	761.4	775.2	768.3

S.E. of marginal mean of N =49.30 lb./ac.

S.E. of marginal mean of K =34.86 lb./ac.

S.E. of body of table =69.73 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49 (45).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :-To study the effect of graded doses of N in the form of F.Y.M. and A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24.3.1949. (iv) (a) 5 ploughings and 7 *sohaga*. (b) N.A. (c) $\frac{3}{4}$ oz./*marla*. (d) Row to row 2'; plant to plant 1'. (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckerings and 4-5 hoeings. (ix) 5.87". (x) 26.7.1949.

2. TREATMENTS

All combinations of (1) and (2)+a control.

(1) 2 sources of N : S₁=F.Y.M. and S₂=A/S.(2) 3 levels of N : N₁=50, N₂=100 and N₃=150 lb./ac. of N.

F.Y.M. applied on 24.3.1949 and A/S on 1.5.1949 and 14.5.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 55'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Crop receiving N in A/S had dark coloured leaves as compared to plots receiving F.Y.M.

5. RESULTS

(i) 1074 lb./ac.

(ii) 191.0 lb./ac.

(iii) Overall treatment effect is significant. Main effect of N and "control vs other treatments" effects are significant.

(iv) Av. yield of tobacco in lb./ac.

Control = 877 lb./ac.

	S ₁	S ₂	Mean
N ₁	1028	1003	1015
N ₂	1001	1190	1096
N ₃	1039	1381	1210
Mean	1023	1191	1107

S.E. of marginal mean of S =45.0 lb./ac.

S.E. of marginal mean of N =55.1 lb./ac.

S.E. of body of table =78.0 lb./ac.

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 50(41).
Type :- 'M'.

Object :- To find out if F.Y.M. can be substituted by artificial fertilizers A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 18.2.1950. (iv) (a) 5 ploughings and 7 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19". (x) 16.6.1950.

2. TREATMENTS :

1. F.Y.M. at 50 lb./ac. of N.
2. F.Y.M. at 100 lb./ac. of N.
3. F.Y.M. at 150 lb./ac. of N.
4. F.Y.M. at 200 lb./ac. of N.
5. F.Y.M. at 300 lb./ac. of N.
6. A/S at 50 lb./ac. of N.
7. A/S at 75 lb./ac. of N.
8. A/S at 100 lb./ac. of N.
9. A/S at 150 lb./ac. of N.
10. Control (no manure).

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) and (b) 36' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height and rope weight. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1251 lb./ac.
- (ii) 263.0 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1059
2.	1182
3.	1372
4.	1372
5.	1458
6.	1294
7.	1245
8.	1207
9.	1251
10.	1070

S.E /mean = 117.6 lb./ac.

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 51(8).
Type :- 'M'.

Object : To find out if F.Y.M. can be substituted by artificial fertilizer A/S.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Fodder. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 24.2.1951. (iv) (a) 8 ploughings, 9 *sohaga* and 2 rollings. (b) and (c) N.A. (d) 1' x 1½'. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling, two hoeings, one topping and suckering. (ix) 0.91". (x) 17.6.1951 and 26.6.1951.

2. TREATMENTS :

- | | |
|--------------------------------|------------------------------|
| 1. F.Y.M. at 50 lb./ac. of N. | 7. A/S at 50 lb./ac. of N. |
| 2. F.Y.M. at 100 lb./ac. of N. | 8. A/S at 75 lb./ac. of N. |
| 3. F.Y.M. at 150 lb./ac. of N. | 9. A/S at 100 lb./ac. of N. |
| 4. F.Y.M. at 200 lb./ac. of N. | 10. A/S at 150 lb./ac. of N. |
| 5. F.Y.M. at 300 lb./ac. of N. | 11. Control. |
| 6. A/S at 25 lb./ac. of N. | |

F.Y.M. applied before transplanting on 23.2.51. Half of A/S applied on 23.2.51 and the other half on 24.4.51.

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) and (b) 27' × 10'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, wt. of green leaves, no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 672.7 lb./ac.
(ii) 163.50 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	525.5	7.	731.2
2.	466.7	8.	789.9
3.	551.4	9.	900.6
4.	624.0	10.	949.0
5.	655.1	11.	433.9
6.	772.7		

S.E./mean = 66.75 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 49(46).

Type :- 'M'.

Object :- To find a suitable time of application of manures.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 17.3.1949. (iv) (a) 5 ploughings and 7 *sohaga*. (b) and (c) N.A. (d) Row to row 2', plant to plant 1'. (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 5.87". (x) 23.7.1949.

2. TREATMENTS :

1. Manure applied in full dose just before planting on 15.3.1949.
2. Manure applied in two equal doses one month after planting and two months after planting on 17.4.1949 and 17.5.1949.
Manure : A/S at 100 lb./ac. of N.

3. DESIGN :

- (i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 45' × 8'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) (a) Nil. (iii) Rope weight. (iv) (a) 1949—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1380 lb./ac.
(ii) 371.2 lb./ac.
(iii) Treatments are not significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1497
2.	1263
S.E./mean	= 166.0 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(42).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'M'.

Object :- To find the best time and method of application of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22.2.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19". (x) 24.6.1959.

2. TREATMENTS:

1. Manure applied in full dose before planting.
 2. $\frac{1}{2}$ dose of manure applied before planting and $\frac{1}{2}$ dose one month after planting.
 3. $\frac{1}{2}$ dose of manure applied one month after planting and $\frac{1}{2}$ dose two months after planting.
- Manure : A/S at 100 lb./ac. applied on 2.2.1950, 27.3.1950 and 25.4.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 36' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest and rope wt. (iv) (a) 1949—1951. (b) and (c) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1595 lb./ac.
- (ii) 257.3 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1616
2.	1674
3.	1495
S.E./mean	= 91.0 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(9).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'M'.

Object :- To find out the best time and method of application of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 6 ploughings, 7 *sohaga* and 1 rolling. (b) and (c) N.A. (d) 1' x 1 $\frac{1}{2}$ '. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling and one hoeing. (ix) 0.91". (x) 24.6.1951.

2. TREATMENTS :

1. Manure applied in full dose before planting.
 2. $\frac{1}{2}$ dose of manure applied before planting and $\frac{1}{2}$ dose one month after planting.
 3. $\frac{1}{2}$ dose of manure applied one month after planting and $\frac{1}{2}$ dose two months after planting.
- Manure : 100 lb /ac. of N as A/S,

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 27'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, wt. of green leaves, no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 925.2 lb./ac.

(ii) 106.7 lb./ac.

(iii) Treatments are not significantly different.

(i) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	950.3
2.	933.4
3.	892.9
S.E./mean	=37.7 lb./ac.

Crop :-Tobacco.

Ref :-Pb. 50(43).

Site :-Agri. Stn., Ferozepur Cantt.

Type :-'M'.

Object :—To study if G.N.C. can be substituted for F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24.2.1950. (iv) (a) 7 ploughings and 8 *sohaga*. (b) and (c) N.A. (d) 15"×9". (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19". (x) 14.6.1950.

2. TREATMENTS :

1. G.N.C. at 300 lb./ac. of N.

2. F.Y.M. at 300 lb./ac. of N.

Manures applied before planting.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 22'×8'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest, rope wt. and tobacco yield. (iv) (a) 1950—1951 (modified in 1951). (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1126 lb./ac

(ii) 224.2 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1148
2.	1103
S.E./mean	=100.3 lb./ac.

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 51(10).
Type :- 'M'.

Object :- To study if G.N.C. can be substituted for F.Y.M.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Fodder. (b) *Guara* (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1951. (iv) (a) 1 ploughing with *raja* plough, 4 *desi* ploughings, 1 roller and 5 *sohaga*. (b) and (c) N.A. (d) 1' x 1½'. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) 1 gap filling, 1 hoeing, 2 toppings and suckering. (ix) 0.91". (x) 18.6.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 manures : M_1 =G.N.C. at 300 lb./ac. of N, M_2 =F.Y.M. at 300 lb./ac. of N, and M_3 =G.N.C. at 150 lb./ac. of N+F.Y.M. at 150 lb./ac. of N.

(2) 2 times of application : T_1 =December 1950 and T_2 =February 1951.

3. DESIGN :

(i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 27' x 10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, wt. of green leaves no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1295 lb./ac.
(ii) 251.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of tobacco lb./ac.

	T_1	T_2	Mean
M_1	1421	1366	1394
M_2	1042	1262	1152
M_3	1248	1429	1339
Mean	1237	1352	1295

S.E. of marginal mean of M = 72.6 lb./ac.
S.E. of marginal mean of T = 59.3 lb./ac.
S.E. of body of table = 102.7 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(23).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To study the effect of G.N.C. and F.Y.M. on yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with *raja* plough, 6 *desi* ploughings, 9 plankings and one horse hoe. (b) and (c) N.A. (d) 2' x 1'. (e) N.A. (v) Nil. (vi) *N-rustica*. T-16 (medium). (vii) Irrigated. (viii) 1 gap filling, 3 hoeings, 5 toppings and suckering. (ix) 0.91". (x) 19,20.6.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of manures : M_1 =300 lb./ac. of N as G.N.C., M_2 =300 lb./ac. of N as F.Y.M. and M_3 =150 lb./ac. of N as G.N.C. and 150 lb./ac. of N as F.Y.M.

(2) 2 times of application : T_1 =Dec. 1950 and T_2 =Feb. 1951.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 25'×10'. (b) 22'×10'. (v) 1.5' border left along breadth. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950-51. (b) and (c) No. (v) (a) and (vi) and (vii) Nil.

5. RESULTS :

- (i) 974.0 lb./ac.
 (ii) 191.1 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of tobacco in lb./ac.

	T ₁	T ₂	Mean
M ₁	1269.4	894.0	1081.7
M ₂	553.2	794.7	674.0
M ₃	1055.9	1276.6	1166.3
Mean	959.5	988.4	974.0

S.E. of marginal mean of M = 55.17 lb./ac.
 S.E. of marginal mean of T = 45.05 lb./ac.
 S.E. of body of table = 78.03 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(54).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To study the comparative effect of F.Y.M. and G.N.C.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9.3.1950. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 1 oz./*marla*. (d) 12"×9". (e) N.A. (v) Nil. (vi) T-26. (vii) Irrigated. (viii) 6-7 topping and suckerings and 4 hoeings. (ix) 1.19". (x) 31.5.1950 to 15.6.1950.

2. TREATMENTS :

- G.N.C. at 300 lb./ac. of N.
- F.Y.M. at 300 lb./ac. of N.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 22'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) 1950 to 1951 (modified in 1951). (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 344.1 lb./ac.
 (ii) 132.0 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	349.6
2.	338.6
S.E./mean	= 53.9 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(25).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'M'.

Object :- To find out the utility of application of N at pre-flowering and post-flowering time.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—*Guara*. (b) *Guara*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22.2.1953.
 (iv) (a) 1 ploughing with *raja* plough, 8 *desi* ploughings, 8 *sohaga* and 1 horse hoe. (b) and (c) N.A.
 (d) 1' from row to row; 6" form plant to plant. (e) N.A. (v) F.Y.M. at 300 lb./ac. of N was applied one month before planking by broadcast to all the plots. (vi) T-23 (medium). (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 1.37". (x) 8.6.1953 and 15.6.1953.

2. TREATMENTS :

1. Control.
 2. 100 lb./ac. of N at planting.
 3. 50 lb./ac. of N at planting + 50 lb./ac. of N at flowering time.
 4. 50 lb./ac. of N at planting + 25 lb./ac. of N at pre-flowering + 25 lb./ac. of N at post-flowering time.
 5. 50 lb./ac. of N at planting + 50 lb./ac. of N at post-flowering.
- N applied in the form of A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 20' × 9½'. (b) 20' × 8'. (v) 1 row on 2 sides of a plot.
 (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Total no. of plants at harvest, average no. of leaves per plant, height in cm., average length of leaves in cm. and dry weight of tobacco. (iv) (a) 1953—1955. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1182 lb./ac.
 (ii) 230.1 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of dry leaf in lb./ac.

Treatment	Av. yield
1.	776
2.	1135
3.	1380
4.	1371
5.	1246
S.E./mean	= 93.9 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(31).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'M'.

Object :- To find out the utility of application of N at pre-flowering and post-flowering time.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-*Guara*. (b) *Guara*. (c) No. (ii) (a) Heavy loam. (b) N.A. (iii) 16.2.1953.
 (iv) (a) 1 ploughing with *raja* plough, 5 *desi* ploughings, 8 plankings and 1 horse hoe. (b) and (c) N.A.
 (d) 1' row to row and 9" plant to plant. (e) N.A. (v) 300 lb./ac. of N was applied in the form of F.Y.M., one month before planting, by broadcasting. (vi) T-26 *N-rustica* (medium). (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) 0.34". (x) 20.5.1953 to 27.5.1953.

2. TREATMENTS :

1. Control.
2. 100 lb./ac. of N as A/S at planting time.
3. 50 lb./ac. of N as A/S at planting time + 50 lb./ac. of N as A/S at flowering time.
4. 50 lb./ac. of N as A/S at planting time + 25 lb./ac. of N as A/S at pre-flowering time. + 25 lb./ac. of N as A/S at post-flowering time.
5. 50 lb./ac. of N as A/S at planting time + 50 lb./ac. of N as A/S at post-flowering time.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 20' × 9½'. (b) 20' × 8'. (v) One row around. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Length and breadth of leaves in cm., no. of plants at harvest, green plant weight, height of plant and dry weight of tobacco. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1563 lb./ac.

(ii) 296.2 lb./ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1053
2.	1666
3.	1633
4.	1928
5.	1534
S.E./mean	=120.9 lb./ac.

Crop :- Tobacco

Ref :- Pb. 50(38).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'M'.

Object :- To find the best manurial dose for nursery planting of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22.2.1950. (iv) (a) 6 ploughings and 8 *sohaga*. (b) N.A. (c) ½ oz./marla. (d) 15" × 9". (e) N.A. (v) Nil. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 topplings and suckerings and 4-5 hoeings. (ix) 1.19". (x) 14.6.1950 and 24.6.1950.

2. TREATMENTS :

1. F.Y.M. at 100 lb./ac. of N.

2. F.Y.M. at 200 lb./ac. of N.

3. F.Y.M. at 300 lb./ac. of N.

4. A/S at 50 lb./ac. of N.

5. A/S at 100 lb./ac. of N.

6. A/S at 150 lb./ac. of N.

F.Y.M. before planting. A/S on 2.4.1950, 8.4.1950 and 13.4.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22' × 7½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, stand, no. of leaves, length and breadth of leaves, height of seedlings, rope weight/plant and tobacco yield. (iv) (a) 1950-1951 (modified during 1950). (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1013 lb./ac.

(ii) 215.5 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1021
2.	1083
3.	931
4.	1035
5.	1095
6.	914
S.E./mean	=88.0 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51 (6).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To find the best manurial dose for the nursery planting of Tobacco

1. BASAL CONDITIONS

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3.3.1951. (iv) (a) 8 ploughings, 8 *sohaga*, 1 horse hoe and 2 rollings. (b) and (c) N.A. (d) 1' x 1½'. (e) N.A. (v) As per treatments. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling, one topping and suckering. (ix) 0.91". (x) 20.6.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 6 applications of N : N₁=100, N₂=200 and N₃=300 lb./ac. of N as F.Y.M., N₄=50, N₅=100 and N₆=150 lb./ac. of N as A/S.

(2) 2 levels of basal dressing : B₀=No basal dressing and B₁=Basal dressing with F.Y.M. at 100 lb./ac. of N.

All the treatments applied at nursery stage.

3. DESIGN :

(i) 2 x 6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cm., height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1950 to 1951. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 490.8 lb./ac.
 (ii) 124.4 lb./ac.
 (iii) Over all treatments are not significant.
 (iv) Av. yield of tobacco in lb./ac.

	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	Mean
B ₀	509.1	512.0	500.7	475.2	489.3	497.8	497.4
B ₁	458.2	441.3	526.1	444.1	537.4	497.8	484.2
Mean	483.7	476.7	513.4	459.7	513.4	497.8	490.8

S.E. of marginal mean of B

=20.7 lb./ac.

S.E. of marginal mean of N

=35.9 lb./ac.

S.E. of body of table

=50.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50 (53).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To study the effect of F.Y.M. and A/S in presence and absence of K₂O.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9.3.1950 to 13.3.1950. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 1 oz. *marla*. (d) 12" x 9". (e) N.A. (v) Nil. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckerings and 4-5 hoeings. (ix) 1.19". (x) 31.5.1950 to 15.6.1950.

2. TREATMENTS :

Main-plot treatments :

N₁=F.Y.M. at 100 lb./ac. of N, N₂=F.Y.M. at 200 lb./ac. of N, N₃=F.Y.M. at 300 lb./ac. of N, N₄=A/S at 50 lb./ac. of N, N₅=A/S at 100 lb./ac. of N and N₆=A/S at 150 lb./ac. of N.

Sub-plot treatments :

2 levels of K₂O : K₀=N₀ K₂O and K₁=50 lb./ac. of K₂O as Pot. Sul.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot. (iii) 6. (iv) (a) N.A. (b) 22'×10'.
(v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 509.4 lb./ac.
(ii) (a) 166.9 lb./ac.
(b) 140.5 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Av. yield of tobacco in lb./ac.

	N ₁	N ₂	N ₃	N ₄	N ₅	N ₆	Mean
K ₀	356.4	443.8	661.9	459.9	533.8	538.8	499.1
K ₁	323.3	525.3	676.3	468.4	588.0	536.3	519.6
Mean	339.9	484.6	669.1	464.2	560.9	537.6	509.4

S.E. of difference of two

- | | |
|-----------------------------------|---------------|
| 1. N marginal means | =68.9 lb./ac. |
| 2. K marginal means | =30.9 lb./ac. |
| 3. K means at the same level of N | =89.0 lb./ac. |
| 4. N means at the same level of K | =81.1 lb./ac. |

Crop :- Tobacco.

Ref :- Pb. 50(55).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To study the best time of application of manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9.3.1950. (iv) (a) to (e), N.A. (v) Nil (vi) T-26. (vii) Irrigated. (viii) 6-7 Toppings and suckering and 2 hoeings. (ix) 1.19". (x) 31.5.1950.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N full dose before planting.
2. A/S at 50 lb./ac. of N after one month of planting and 50 lb./ac. of N after 2 months of planting.
3. A/S at 50 lb./ac. of N before planting and 50 lb./ac. of N one month after planting.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 22'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants and tobacco yield. (iv) (a) Continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 676.9 lb./ac.
(ii) 97.93 lb./ac.
(iii) Treatments are highly significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	769.4
2.	584.9
3.	676.5
S.E./mean	= 34.62 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(18).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :—To find out if F.Y.M. can be substituted for A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 4.3.1951. (iv) (a) 1 ploughing with *raja* plough, 7 *desi* plough, 7 *sohaga* and 2 roller. (b) and (c) N.A. (d) 2' x 1'. (e) N.A. (v) As per treatments. (vi) *N-rustica*, T-186 (medium). (vii) Irrigated. (viii) 1 gap filling, 2 toppings and suckering. (ix) 0.91". (x) 28.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 6 applications of N : $N_1=100$, $N_2=200$ and $N_3=300$ lb./ac. of N as F.Y.M.; $N_4=50$, $N_5=100$ and $N_6=150$ lb./ac. of N as A/S.

(2) 2 levels of basal dressing : B_0 =No Basal dressing. B_1 =Basal dressing at 100 lb./ac. of N as F.Y.M. in 1st week of Feb.

DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 5. (iv) (a) 27' x 15'. (b) 22' x 10'. (v) 2½' left out all round the plots. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) 1951-1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1158 lb./ac.

(ii) 178.4 lb./ac.

(iii) N and 'control vs other treatments' effects are highly significant. B effect is significant while interaction B x M is not significant.

(iv) Av. yield of tobacco in lb./ac.

Control = 816 lb./ac.

	B_0	B_1	Mean
N_1	910	956	933
N_2	941	1060	1001
N_3	1035	1140	1088
N_4	1119	1410	1265
N_5	1271	1433	1352
N_6	1489	1477	1483
Mean	1128	1246	1137

S.E. of marginal means of N
S.E. of marginal means of B
S.E. of body of table

=56.4 lb./ac.
=32.6 lb./ac.
=79.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(91).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To find if F.Y.M. can be substituted for A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) 50 lb./ac. of N. (ii) (a) Heavy loam. (b) N.A. (iii) 16.2.1952. (iv) (a) 7 ploughings, 6 *sohaga* and 1 *triphally*. (b) N.A. (c) 2 oz./marla. (d) 12"×9". (e) N.A. (v) As per treatments. (vi) T-26 (medium). (vii) Irrigated. (viii) 6 toppings and suckering and 5 hoeings. (ix) 1.86". (x) 1,2.6.1952.

2. TREATMENTS :

1. F.Y.M. at 100 lb./ac. of N.
2. F.Y.M. at 200 lb./ac. of N.
3. F.Y.M. at 300 lb./ac. of N.
4. A/S at 50 lb./ac. of N.
5. A/S at 100 lb./ac. of N.
6. A/S at 150 lb./ac. of N.
7. A/S at 50 lb./ac. of N+basal dressing.
8. A/S at 100 lb./ac. of N+basal dressing.
9. A/S at 150 lb./ac. of N+basal dressing.
10. Control.

F.Y.M. applied on 22.1.1952 and 28.1.1952 while A/S applied on 23.4.1952. Basal dressing at 100 lb./ac. of N as F.Y.M. applied on 22.1.1952 and 28.1.1952.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) 22'×12'. (b) 22'×10'. (v) 1' along length of each plot including border and bund left out. (vi) Yes.

4. GENERAL :-

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1951-1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1136 lb./ac.
 (ii) 289.0 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1092
2.	1091
3.	1082
4.	880
5.	1110
6.	1360
7.	1208
8.	1429
9.	1480
10.	624
S.E./mean	=129.3 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(28).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To find out if F.Y.M. can be substituted by artificial fertilizers.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—*Guara*. (b) *Guara*. (c) No. (ii) (a) Loam. (b) N.A. (iii) 11.2.1953. (iv) (a) 1 ploughing with *raja* plough, 6 *desi* ploughings, 13 plankings and 1 horse hoe. (b) and (c) N.A. (d) 1' from row to row and 9" from plant to plant. (e) N.A. (v) As per treatments, (vi) T-26, *N-rustica* (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 0.24". (x) 21.5.1953 and 2.6.1953.

2. TREATMENTS :

1. F.Y.M. at 100 lb./ac. of N as basal dose.
2. F.Y.M. at 200 lb./ac. of N as basal dose.
3. F.Y.M. at 300 lb./ac. of N as basal dose.
4. A/S at 50 lb./ac. of N.
5. A/S at 100 lb./ac. of N.
6. A/S at 150 lb./ac. of N.
7. A/S at 50 lb./ac. of N+100 lb./ac. of N as F.Y.M. as basal dose.
8. A/S at 100 lb./ac. of N+100 lb./ac. of N as F.Y.M. as basal dose.
9. A/S at 150 lb./ac. of N+100 lb./ac. of N as F.Y.M. as basal dose.
10. Control.

F.Y.M. applied one month before planting by broadcast and A/S applied at the time of sowing.

3. DESIGN:

- (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) 22'×12'. (b) 22'×10'. (v) 1' border left on two sides of each plot along length. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Height in cm., green plant weight, length and breadth of leaf in cm., av. no. of leaves, dry weight of tobacco. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 966.2 lb./ac.
 (ii) 380.6 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	555.0
2.	539.7
3.	689.9
4.	1130.3
5.	1112.5
6.	1451.1
7.	977.6
8.	1364.5
9.	1647.1
10.	493.9
S.E./mean	=170.2 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(17).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :—To find out the best manurial formula for Tobacco crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 4.3.1951. (iv) (a) 1 raja ploughing, 6 desi ploughing, 7 sohaga and 1 roller. (b) and (c) N.A. (d) 2'×1'. (e) N.A. (v) Nil. (vi) N—rustica T-16 (medium). (vii) Irrigated. (viii) N.A. (ix) 0.91". (x) 26.6.1951.

2. TREATMENTS

All combination of (1) and (2)

- (1) 2 levels of K_2O : $K_0=0$ and $K_1=50$ lb./ac. of K_2O as Pot. Sul.
 (2) 4 sources of N : $N_1=A/S$, $N_2=Ammo.$ Phos. $N_3=Pot.$ Nit. and $N_4=F.Y.M.$ each at 100 lb./ac. of N.

3. DESIGN :

- (i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 24'×10'. (b) 22'×10'. (v) 1' on each side of a breadth of a plot. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no of leaves/plant, green wt., length and breadth of leaves in cm, height in cm., no. of plants at harvest. (iv) (a) 1951 to 1953. (b) No. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 847.7 lb./ac.
 (ii) 114.63 lb./ac.
 (iii) N effect is highly significant, K effect is significant while interaction is not significant.
 (iv) Av. yield of tobacco in lb./ac.

	K ₀	K ₁	Mean
N ₁	791.9	898.4	845.2
N ₂	1025.7	1091.4	1058.6
N ₃	970.3	1137.2	1053.8
N ₄	441.5	424.7	433.1
Mean	807.4	887.9	847.7

S.E. of marginal mean of N = 33.09 lb./ac.
 S.E. of marginal mean of K = 23.40 lb./ac.
 S.E. of body of table = 46.80 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozpur Cantt.

Ref :- Pb. 52(97).

Type :- 'M'.

Object :- To find the best manurial formula for Tobacco crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 17.2.1952. (iv) (a) 8 ploughings 6 *sohaga* and 2 rollings. (b) N.A. (c) 2 oz./*marla*. (d) 12" × 9". (e) N.A. (v) Nil. (vi) T-26 (medium). (vii) Irrigated. (viii) 1 gap filling, 3 hoeings, 5 suckerings and topping. (ix) 1.86". (x) 18.5.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of K₂O : K₀=0 and K₁=50 lb./ac. of K₂O as Pot. Sul.

(2) 4 sources of N : N₁=A/S, N₂=Ammono. Phos., N₃=Pot. Nit. and N₄=F.Y.M. each at 100 lb./ac. of N.

3. DESIGN :

(i) 2 × 4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22' × 12'. (b) 22' × 10'. (v) 1' along length of each plot left out as bunds. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Dry wt. ropes, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS

- (i) 1533 lb./ac.
 (ii) 223.2 lb./ac.
 (iii) Main effect of N alone is highly significant.

(iv) Av. yield of tobacco in lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
K ₀	1835	1698	1533	1249	1579
K ₁	1368	1670	1626	1292	1489
Mean	1602	1684	1580	1271	1533

S.E. of marginal mean of K = 45.6 lb./ac.
 S.E. of marginal mean of N = 64.4 lb./ac.
 S.E. of body of table = 91.1 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53 (27).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M':

Object :- To find out the most suitable manurial combination for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Guara. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 10, 11.2.1953.
 (iv) (a) 1 ploughing with *raja* plough, 7 *desi* ploughings, 9 plankings and 1 horse hoe. (b) and (c) N.A.
 (d) 1' from row to row, 9" from plant to plant. (v) F.Y.M. at 100 lb./ac. of N one month before planking by broadcast (vi) T-26 *N-rustica* (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 1.42". (x) 4.6.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=50 lb./ac.(2) 4 sources of N : N₁=A/S, N₂=Ammono. Phos., N₃=Pot. Nitrate and N₄=F.Y.M. each at 100 lb./ac. of N.

3. DESIGN :

(i) 2×4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22'×12'. (b) 22'×10'. (v) 1' border along length. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Length and breadth of leaf in cm., average height of plant, no. of leaves per plant, green plant weight, no. of plants at harvest, dry weight. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1143 lb./ac.

(ii) 385.4 lb./ac.

(iii) Over all treatments are highly significant. N effect is highly significant while other effects are not significant.

(iv) Av. yield of tobacco in lb./ac.

	N ₁	N ₂	N ₃	N ₄	Mean
K ₀	1290	1432	1646	598	1242
K ₁	1178	1143	1443	414	1044
Mean	1234	1288	1545	506	1143

S.E. of marginal mean of K = 78.7 lb./ac.
 S.E. of marginal mean of N = 111.2 lb./ac.
 S.E. of body of table = 222.5 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52 (86).

Site :- Agri. Stn., Ferozepur.

Type :- 'M'.

Object :- To find out the best manurial formula for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N. A. (iii) 2.3.1952. (iv) (a) 1 tractor ploughing, 7 ploughings, 9 plankings and 2 rollers. (b) N.A. (c) 10 lb./ac. (d) 1' x 1½'. (e) N.A. (v) Nil. (vi) T-23 (early). (vii) Irrigated. (viii) 1 gap filling, 4 hoeings, 6 toppings and suckering. (ix) 1.86". (x) 19.6.1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0=0$ and $F_1=300$ lb./ac. of N as F.Y.M.

Sub-plot treatments :

8 manurial combinations : M_0 =Control (no manure), M_1 =A/S at 100 lb./ac. of N, M_2 =G.N.C. at 100 lb./ac. of N, M_3 =A/S at 50 lb./ac. of N+G.N.C. at 50 lb./ac. of N, M_4 =A/S at 100 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 , M_5 =G.N.C. at 100 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 , M_6 =A/S at 50 lb./ac. of N+G.N.C. at 50 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 and M_7 =Super at 50 lb./ac. of P_2O_5 .

G.N.C., F.Y.M. and Super applied one month before planting and ¼ dose of A/S applied before planting, ¼ dose applied one month after planting, ¼ dose applied on 22.4.1952 at the time of topping.

3. DESIGN

(i) Split-plot (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36' x 8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and rope, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 834.4 lb./ac.
 (ii) (a) 273.2 lb./ac.
 (b) 162.7 lb./ac.
 (iii) Main-plot treatment effects and interaction (main-plot x sub-plot) are not significant. Sub-plot treatment effects are highly significant.
 (iv) Av. yield of tobacco in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	Mean
F_0	369.5	944.8	789.2	858.9	946.4	824.9	972.3	450.5	769.5
F_1	536.4	1066.3	941.5	1037.1	978.8	1016.1	985.3	632.0	899.2
Mean	453.0	1005.6	865.4	948.0	962.6	920.5	978.8	541.3	834.4

S.E. of difference of two

1. F marginal means = 55.8 lb./ac.
2. M marginal means = 66.4 lb./ac.
3. M means at the same level of F = 93.9 lb./ac.
4. F means at the same level of M = 104.1 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(30).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To find out best manurial formula for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Guara. (b) Guara. (c) No. (ii) (a) Heavy loam. (b) N.A. (iii) 25/26.2.1953. (iv) (a) 1 ploughing with *raja* plough, 6 *desi* ploughings and 7 plankings. (b) and (c) N.A. (d) 1' from row to row and 9" from plant to plant. (e) N.A. (v) As per treatments. (vi) T-26 *N-rustica* (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 0.34". (x) 21.5.1953 and 29.5.1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F_0 = No F.Y.M. and F_1 = 300 lb./ac. of N as F.Y.M.

Sub-plot treatments :

8 manurial combinations : M_0 = Control (no manure), M_1 = A/S at 100 lb./ac. of N, M_2 = G.N.C. at 100 lb./ac. of N, M_3 = A/S at 50 lb./ac. of N + G.N.C. at 50 lb./ac. of N, M_4 = A/S at 100 lb./ac. of N + Super at 50 lb./ac. of P_2O_5 , M_5 = G.N.C. at 100 lb./ac. of N + Super at 50 lb./ac. of P_2O_5 , M_6 = A/S at 50 lb./ac. of N + G.N.C. at 50 lb./ac. of N + Super at 50 lb./ac. of P_2O_5 and M_7 = Super at 50 lb./ac. of P_2O_5 .

G.N.C., F.Y.M. and Super applied one month before planting, while $\frac{1}{2}$ dose of A/S applied one week before planting, $\frac{1}{2}$ dose applied three weeks after planting and $\frac{1}{2}$ applied at topping time. G.N.C. was applied in plough furrows. A/S was broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 41' x 9 $\frac{1}{2}$ '. (b) 36' x 8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) No. of plants at harvest, length in cm., date of flowering, average no. of leaves, length and breadth of leaf in cm., green plant weight. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1250 lb./ac.
 (ii) (a) 637.9 lb./ac.
 (b) 276.8 lb./ac.
 (iii) Sub-plot treatment effects are highly significant. Main-plot treatment effects and interaction main-plot x sub-plot are not significant.
 (iv) Av. yield of tobacco in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	Mean
F_0	515	1160	1173	1415	1275	1326	1470	515	1106
F_1	990	1591	1227	1632	1580	1441	1603	1086	1394
Mean	753	1376	1200	1524	1428	1384	1537	801	1250

S.E. of difference of two

1. F marginal means = 130.2 lb./ac.
 2. M marginal means = 113.0 lb./ac.
 3. M means at the same level of F = 159.8 lb./ac.
 4. F means at the same level of M = 198.2 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(90).

Site :- Agri. S tn., Ferozepur.

Type :- 'M'.

Object :—To find out the best manurial formula for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 27, 28.2.1952. (iv) (a) 5 *desi* ploughings, 6 *sohaga* and 3 rollerings. (b) N.A. (c) 2 oz./marla. (d) 1'×9". (e) N.A. (v) Nil. (vi) T-26 *N-rustica* (medium). (vii) Irrigated. (viii) 1 gap filling, 5 hoeings, 6 toppings and suckering. (ix) 1.86" (x) 24.5.1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F_0 =No F.Y.M. and F_1 =300 lb./ac. of N as F.Y.M.

Sub-plot treatments :

8 manurial combinations : M_0 =Control (no manure), M_1 =A/S at 100 lb./ac. of N, M_2 =G.N.C. at 100 lb./ac. of N, M_3 =A/S at 50 lb./ac. of N+G.N.C. at 50 lb./ac. of N, M_4 =A/S at 100 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 , M_5 =G.N.C. at 100 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 , M_6 =A/S at 50 lb./ac. of N+G.N.C at 50 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 and M_7 =Super at 50 lb./ac. of P_2O_5 .

G.N.C., F.Y.M. applied on 27.1.1952 by broadcast method. Supper applied on 26.1.1952 by broadcast method and A/S applied on 26.2.1952, 30.3.1952 and on 4.5.1952 ($\frac{1}{3}$ each time) by broadcast method.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 42.3'×10'. (b) 36.3'×8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. no. of leaves/plant, breadth and length of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1554 lb./ac.

(ii) (a) 334.7 lb./ac.

(b) 254.8 lb./ac.

(iii) Main-plot treatment effects are significant, sub-plot treatment effects are highly significant, while interaction main-plot×sub-plot is not significant.

(iv) Av. yield of tobacco in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	Mean
F_0	884	1537	1415	1584	1643	1546	1477	1357	1430
F_1	1225	1723	1697	1832	1873	1903	1815	1344	1677
Mean	1055	1630	1556	1708	1758	1725	1646	1351	1554

S.E. of difference of two

1. F marginal means = 68.3 lb./ac.
2. M marginal means = 104.1 lb./ac.
3. M means at the same level of F = 147.2 lb./ac.
4. F means at the same level of M = 153.6 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(22).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object : To find out the best manurial formula for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—Guara. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 2,3.3.1953. (iv) (a) 1 ploughing with *raja* plough, 6 *dest* ploughings and 7 plankings. (b) and (c) N.A. (d) 1' from row to row and 6" from plant to plant. (e) N.A. (v) Nil. (vi) T-23 (medium). (vii) Irrigated. (viii) 3 weedings and hoeing. (ix) 1.37". (x) 8.6.1953 and 16.6.1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F_0 =No F.Y.M. and F_1 =300 lb./ac. of N as F.Y.M.

Sub-plot treatments :

8 combinations of manures : M_0 =Control, (no manure), M_1 =A/S at 100 lb./ac. of N, M_2 =G.N.C. at 100 lb./ac. of N, M_3 =A/S at 50 lb./ac. of N+G.N.C. at 50 lb./ac., M_4 =A/S at 100 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 , M_5 =G.N.C. at 100 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 , M_6 =A/S at 50 lb./ac. of N +G.N.C. at 50 lb./ac. of N+Super at 50 lb./ac. of P_2O_5 and M_7 =Super at 50 lb./ac. of P_2O_5 .

G.N.C. and Super applied one month before planting. A/S applied as follows :— $\frac{1}{4}$ th amount applied a week before planting, $\frac{1}{2}$ three weeks after planting and remaining $\frac{1}{4}$ at the time of topping by broadcast method.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 22' x 9.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Number of leaves, height in cm., length and breadth of leaves in cm. and dry leaf weight. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 630.9 lb./ac.
(ii) (a) 245.0 lb./ac.
(b) 177.7 lb./ac.
(iii) Main effects of F and M are highly significant, while interaction is not significant.
(iv) Av. yield of tobacco in lb./ac.

	M_0	M_1	M_2	M_3	M_4	M_5	M_6	M_7	Mean
F_0	259.0	591.8	562.7	571.7	560.5	591.8	538.2	174.2	481.2
F_1	654.3	810.6	866.4	875.4	743.6	788.3	933.4	571.7	780.5
Maen	456.7	701.1	714.6	723.6	652.1	690.1	735.8	373.0	630.9

S.E. of difference of two

1. F marginal means = 50.0 lb./ac.
2. M marginal means = 72.6 lb./ac.
3. M means at the same level of F = 102.6 lb./ac.
4. F means at the same level of M = 108.3 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(89).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To find out response of different manures to *N-rustica* variety of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 18,19.2.1952. (iv) (a) 6 ploughings, 5 *sohaga* and 3 roller. (b) and (c) N.A. (d) 12' × 9'. (e) N.A. (v) Nil. (vi) T-26 (medium). (vii) Irrigated. (viii) 2 gap fillings, 3 hoeings, 4 toppings and suckering. (ix) 1.86". (x) 17.5.1952 and 25.5.1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0=0$, and $F_1=100$ lb./ac. of N as F.Y.M.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=100$ lb./ac.(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.(3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=50$ lb./ac.

F.Y.M. applied on 11,12.2.1952. A/S applied on 2.4.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 8 sub.plots/main-plot, 4 sub-plots/block partially confounding NP, NK, PK and NPK. (b) N.A. (iii) 4. (iv) (a) 42' × 10'. (b) 36.3' × 8'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Setting and growth good ; crop normal. No lodging. (ii) Nil. (iii) Dry wt. and green wt., no. of leaves per plant, breadth and length of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No (c) Nil. (v) (a) No (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1437 lb./ac.

(ii) (a) 117.1 lb./ac.

(b) 244.3 lb./ac.

(iii) Main effects of F is not significant. N effect is highly significant, P_2O_5 effect is significant, while all others are not significant.

(iv) Av. yield of tobacco in lb./ac.

	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	1123	1601	1294	1429	1360	1364	1362
F_1	1344	1680	1453	1571	1431	1594	1512
Mean	1233	1641	1374	1500	1395	1479	1437
K_0	1223	1567	1327	1463			
K_1	1243	1714	1420	1538			
P_0	1214	1533					
P_1	1252	1748					

S.E. of difference of two

1. F marginal means = 29.3 lb./ac.
2. N, P or K marginal means = 61.1 lb./ac.
3. N, P or K means at the same level of F = 86.4 lb./ac.
4. F means at the same level of N, P or K = 67.7 lb./ac.
5. means in body of NP, PK or NK table = 86.4 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(26).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To find out the response of different manures to *N-rustica* variety of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Guara. (b) Guara. (c) No. (ii) (a) Heavy loam. (b) N.A. (iii) 18.19.2.1953. (iv) (a) 1 *raja* plough, 8 *sohaga*, 5 *desi* ploughings and 1 horse hoe. (b) and (c) N.A. (d) 12" x 9". (e) N.A. (v) Nil. (vi) T-26 improved (medium). (vii) Irrigated. (viii) 3 hoeings and weedings. (ix) 0.34". (x) 20.5.1953 to 27.5.1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F_0 = No F.Y.M., F_1 = F.Y.M. at 100 lb./ac. of N.

Sub-plot treatments :

All combinations of (1), (2) and (3)

- (1) 2 levels of N as A/S : N_0 = 0 and N_1 = 100 lb./ac.
 (2) 2 levels of P_2O_5 as Super : P_0 = 0 and P_1 = 50 lb./ac.
 (3) 2 levels of K_2O as Pot. Sul : K_0 = 0 and K_1 = 50 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 2 blocks/main-plot and 4 sub-plots/block. Interaction NP NK, PK and NPK are partially confounded. (b) N.A. (iii) 4. (iv) (a) 41' x 9½'. (b) 36' x 8'. (v) One guard row on each side. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height in cm., no. of leaves/plant, green plant wt., length and breadth of leaf in cm., no. of plants at harvest. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1159.3 lb./ac.
 (ii) (a) 1134.4 lb./ac.
 (b) 223.5 lb./ac.
 (iii) F effect is not significant. N effect is highly significant and P_2O_5 effect is significant. Others are not significant.
 (iv) Av. yield of tobacco in lb./ac.

	N_0	N_1	P_0	P_1	K_0	K_1	Mean
F_0	619.9	1501.0	991.8	1129.1	1126.7	994.2	1060.4
F_1	835.0	1681.5	1194.7	1321.8	1249.4	1267.1	1258.2
Mean	762.1	1614.1	1129.7	1246.4	1188.0	1130.6	1159.3
K_0	762.1	1614.1	1129.7	1246.4			
K_1	692.8	1568.5	1056.8	1204.5			
P_0	679.4	1507.1					
P_1	775.4	1675.4					

S.E. of difference of two

1. F marginal means = 283.6 lb./ac.
 2. N, P or K marginal means = 55.9 lb./ac.
 3. N, P or K means at the same level of F = 79.0 lb./ac.
 4. F means at the same level of N, P or K = 289.1 lb./ac.
 5. means in the body of NP, PK or NK table = 79.0 lb./ac.

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 52(85).
Type :- 'M'.

Object :- To find out if A/S can be substituted by C/N.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 1.3.1952. (iv) (a) 1 tractor ploughing, 9 *hal* and 8 plankings. (b) N.A. (c) 10 lb./ac. (d) 1' x 1½'. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) 2 gap filling, 5 hoeings 2 toppings and suckering. (ix) 1.86". (x) 19.6.1952.

2. TREATMENTS :

All combinations of (1) and (2) + a Control.

(1) 2 sources of N : $S_1 = A/S$ and $S_2 = C/N$.

(2) 2 doses of N : $N_1 = 100$ and $N_2 = 200$ lb./ac.

Fertilizers applied on 12.2.1952 by broadcast method.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 36' x 10' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit weight of stalk and ropes, green wt. in lb., no. of leaves per plant, breadth and length of leaves in cms., height in cms., no. of plants at harvest. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Treatments changed for experiment in 53 (23) and onwards.

5. RESULTS :

(i) 1050 lb./ac.

(ii) 223.2 lb./ac.

(iii) Overall treatments are highly significantly different. "Control vs. other treatments" is highly significant, while others do not differ significantly.

(iv) Av. yield of tobacco in lb./ac.

Control = 585 lb./ac.

	S_1	S_2	Mean
N_1	1099	1342	1221
N_2	972	1252	1112
Mean	1036	1297	1167

S.E. of any marginal mean = 64.4 lb./ac.
S.E. of body of table = 91.1 lb./ac.

Crop :- Tobacco.
Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 53(23).
Type :- 'M'.

Object :- To study the relative efficiency of C/N and A/S as sources of N for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Tobacco—Fallow—Wheat—*Guara*. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 3.4.3.1953, (iv) (a) 1 *raja* ploughing, 6 *desi* ploughings, 7 plankings and 1 horse hoe. (b) and (c) N.A. (d) 1' from row to row, 9" from plant to plant. (e) N.A. (v) Nil. (vi) T-21 N. Tobacco. (late). (vii) Irrigated. (viii) 3 hoeings including weeding. (ix) 1.37". (x) 8.6.1953 and 16.6.1953.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F_0 =No F.Y.M, F_1 =F.Y.M. at 300 lb./ac. of N.

Sub-plot treatments :

M_0 =Control (no manure). M_1 =A/S at 100 lb./ac. of N. M_2 =A/S at 200 lb./ac. of N. M_3 =C/N at 100 lb./ac. of N. M_4 =C/N at 200 lb./ac. of N.

Fertilizers were applied $\frac{1}{2}$ at planting and half at flowering by broadcast with irrigation.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 22'x9 $\frac{1}{2}$ ' (b) 22'x8'. (v) One row on each side. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) No. of plants at the time of harvest, height in cm., date of flowering, average no. of leaves per plant, length and breadth of leaf in cm., green plant weight in cm., dry leaf weight. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1011 lb./ac.
 (ii) (a) 571.6 lb./ac.
 (b) 281.3 lb./ac.
 (iii) Sub-plot treatments effect is highly significant.
 (iv) Av. yield of tobacco in lb./ac.

	M_0	M_1	M_2	M_3	M_4	Mean
F_0	1575	331	634	1151	1114	961
F_1	1681	445	758	1063	1360	1061
Mean	1628	388	696	1107	1237	1011

S.E. of difference of two

1. F marginal means = 147.6 lb./ac.
 2. M marginal means = 114.8 lb./ac.
 3. M means at the same level of F = 162.4 lb./ac.
 4. F means at the same level of M = 207.1 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozpur Cantt.

Ref :- Pb. 52(96).

Type :- 'M'

Object :- To study the effect of micro-nutrients on the yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 10.3.1952. (iv) (a) 6 hal, 5 sohaga and 3 roller. (b) N.A. (c) 2 oz./marla. (d) 12" x 9". (e) N.A. (v) F.Y.M. at 100 lb./ac. of N applied on 12.2.52 by broadcast. (vi) T-26 (medium). (vii) Irrigated. (viii) Two gap filling, 3 hoeings, 3 toppings and suckering. (ix) 1.86". (x) 17.5.1952 and 25.5.1952.

2. TREATMENTS :

1. 2 lb./ac. of Borax.
 2. 3 lb./ac. of Borax.
 3. 4 lb./ac. of Borax.
 4. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6' x 11'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Setting poor ; growth normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt. in lb., no. of leaves/plant, breadth and length of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) No. (b) and (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3034 lb./ac.
 (ii) 563.1 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tobacco in lb./ac.
- | Treatment | Av. yield |
|-----------|----------------|
| 1. | 3016 |
| 2. | 3235 |
| 3. | 3209 |
| 4. | 2677 |
| S.E./mean | =281.6 lb./ac. |

Crop :- Tobacco.
 Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 51(14).
 Type :- 'C'.

Object :- To find out the best method of curing Tobacco leaves.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with *raja* plough, 5 *desi* ploughings, one disc harrowing and planking. (b) and (c) N.A. (d) 1' x 1½'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. a month before planting. (vi) T.21 (medium). (vii) Irrigated. (viii) one gap filling, one interculture with hoe, one topping and suckering. (ix) 0.91". (x) 26.6.1951.

2. TREATMENTS :

1. Sun curing by cutting ½ of stem.
2. Sun curing whole plant.
3. Sun curing by priming.
4. Shade curing whole plant.
5. Shade curing by priming.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cm., height in cm., no. of plants at harvest and yield. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 944.7 lb./ac.
 (ii) 145.57 lb./ac.
 (iii) Treatment effects are not significant.
 (iv) Av. yield of tobacco in lb./ac.
- | Treatment | Av. yield |
|-----------|---------------|
| 1. | 905.1 |
| 2. | 1097.5 |
| 3. | 916.5 |
| 4. | 882.5 |
| 5. | 922.1 |
| S.E./mean | =59.4 lb./ac. |

Crop :- Tobacco.

Ref :- Pb. 52(84).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'C'.

Object :- To find out the best method of curing Tobacco leaves.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 29.2.1952. (iv) (a) 1 tractor ploughing, 9 ploughings and 8 plankings. (b) N.A. (c) 10 lb./ac. (d) 1' x 1½'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. applied on 18.2.1952 ten days before planting by broadcast. (vi) T.21 (medium). (vii) Irrigated. (viii) 2 gap fillings, 5 hoeings, 2 toppings and suckering. (ix) 1.86". (x) 18.6.1952.

2. TREATMENTS :

1. Sun curing by cutting half stalk at the base.
2. Sun curing whole plant.
3. Sun curing by priming.
4. Shade curing whole plant.
5. Shade curing by priming.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and rope, green wt. in lb., number of leaves/plant, breadth and length of leaves in cm. height in cm., no. of plants at harvest and tobacco yield. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 571.4 lb./ac.
 (ii) 169.5 lb./ac.
 (iii) Treatments do not differ significantly.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	410.1
2.	715.6
3.	627.9
4.	588.3
5.	514.8
S E./mean	= 69.2 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49 (51).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'C'.

Object :- To find the effect of topping and suckering on yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.2.1949. (iv) (a) 5 ploughings and 7 *sohaga*. (b) and (c) N.A. (d) 1½' x 1½'. (e) N.A. (v) 24 C.L. of F.Y.M. (vi) T-12 (medium). (vii) Irrigated. (viii) Topping and suckering as per treatments, 4 to 5 hoeings. (ix) 5.87". (x) 17.6.1949 to 15.7.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) Two levels of suckering : S₀=No suckering and S₁=Suckering.

(2) 4 stages of topping : T₁=Topping at 12 leaf stage, T₂=Topping at 15 leaf stage, T₃=Topping at 18 leaf stage and T₄=Topping at flowering stage.

3. DESIGN :

(i) 2 x 4 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 55' x 12' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. Setting good, growth good. No lodging. (ii) Nil. (iii) Rope wt./plot. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1487 lb./ac.
 (ii) 140.9 lb./ac.
 (iii) Topping effect is not significant. Suckering effect is highly significant. Interaction is significant.
 (iv) Av. yield of tobacco in lb./ac.

	T ₁	T ₂	T ₃	T ₄	Mean
S ₀	1291	1260	1298	1146	1249
S ₁	1621	1629	1840	1810	1725
Mean	1456	1445	1569	1478	1487

S.E. of marginal means of T = 40.7 lb./ac.
 S.E. of marginal means of S = 28.8 lb./ac.
 S.E. of body of table = 57.5 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50 (47).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out the effect of topping and suckering on yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 20, 21.2.1950. (iv) (a) 6 ploughings and 6 *sohaga*. (b) N.A. (c) 3/4 oz./marla. (d) 15" × 9". (e) N.A. (v) 28 C.L./ac. of F.Y.M. one week before planting. (vi) T-12 (vii) Irrigated. (viii) Suckering, topping as per treatments and 4 to 5 hoeings. (ix) 1.19". (x) 18.6 1950.

2. TREATMENTS:

Main-plot treatments :

2 levels of suckering : A₁=Suckering and topping and A₂=Suckering and no topping.

Sub-plot treatments :

4 stages of topping : T₁=12 leaf-stage, T₂=15 leaf-stage, T₃=18 leaf-stage and T₄=flowering stage.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) sub-plot (a) N.A. (b) 27' × 12'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest, rope wt./plot. (iv) (a) 1949 to 1951. (b) No. (c) Nil (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1532 lb./ac.
 (ii) (a) 125.8 lb./ac.
 (b) 191.0 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of tobacco in lb./ac.

	T ₁	T ₂	T ₃	T ₄	Mean
A ₁	1439	1523	1459	1554	1494
A ₂	1462	1546	1635	1635	1570
Mean	1451	1535	1547	1595	1532

S.E. of difference of two

1. A marginal means = 36.3 lb./ac.
2. T marginal means = 77.9 lb./ac.
3. T means at the same level of A = 110.3 lb./ac.
4. A means at the same level of T = 102.2 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(13).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :—To study the effect of topping and suckering on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 15.12.1951. (iv) (a) 1 ploughing by *raja* plough, 4 *desi* ploughings, 2 roller and 6 plankings. (b) and (c) N.A. (d) 1'×1½'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. applied one and a half month before planting. Other details N.A. (vi) T-21(medinm). (vii) Irrigated. (viii) 1 gap filling 1 topping and suckering. (ix) 0.91st. (x) 18.6.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of suckering : S₀=No suckering, S₁=suckering,(2) 4 stages of topping : T₁=Topping at 12 leafstage, T₂=Topping at 15 leaf stage, T₃=Topping at 18 leaf stage and T₄=Topping at flowering stage.

3. DESIGN :

(i) 2×4 Fact. in R B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 27'×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cms., height in cms., no. of plants at harvest. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 908.2 lb./ac.

(ii) 227.11 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of tobacco in lb./ac.

	T ₁	T ₂	T ₃	T ₄	Mean
S ₀	878.1	807.2	912.7	974.9	893.2
S ₁	955.9	864.3	981.8	890.2	923.1
Mean	917.0	835.8	947.3	932.6	908.2

S.E. of marginal means of T = 65.56 lb./ac.

S.E. of marginal means of S = 46.36 lb./ac.

S.E. of body of table = 92.72 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(37).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'M'.

Object :- To see the effect of double transplanting and thinning and vigour on yield of crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 28.2.1950 to 1.3.1950 (iv) (a) 6 ploughings, and 7 *sohaga*. (b) N.A. (c) $\frac{1}{2}$ oz./marla. (d) 15" x 9". (e) N.A. (v) 24 C.L./ac. of F.Y.M. on 20.12.1949 two months before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckerings and 4-5 hoeings. (ix) 1.19". (x) 23.6.1950 to 30.6.1950.

2. TREATMENTS :

1. Unthinned seedling.
2. Double transplanting.
3. Thinned seedling.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7 $\frac{1}{2}$ '. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, stand and rope weight. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1348 lb./ac.
- (ii) 324.8 lb./ac.
- (iii) Treatment differences are not significant.
- (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1307
2.	1245
3.	1491
S.E./mean	= 132.6 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(5).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To study the effect of double transplanting and thinning on vigour and yield of crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with *raja* plough, 5 *desi* ploughing and 1 disc harrowing. (b) N.A. (c) 10 lb./ac. (d) 12" x 15". (e) N.A. (v) 200 lb./ac. of N as F.Y.M 5 weeks before planting. (vi) T-21 (medium). (vii) Irrigated. (viii) Gap-filling, 2 thinnings, 1 topping and suckering. (ix) 0.91", (x) 26.6.1951.

2. TREATMENTS :

1. Control.
2. Double transplanting.
3. Thinned seedlings.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7 $\frac{1}{2}$ '. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no., of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950-51. (b) and (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 707.2 lb./ac.
 (ii) 107.56 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	630.8
2.	772.2
3.	718.5
S.E./mean	= 43.91 lb./ac.

Crop :- Tobacco (*Kharif*).

Ref :-Pb. 50(36).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :-To find out the best age for transplanting of seedlings.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 28.2.1950 to 1.3.1950. (iv) (a) 5 ploughings and 7 *sohaga*. (b) N.A. (c) $\frac{1}{2}$ oz./marla. (d) $15'' \times 9''$. (e) N.A. (v) 24 C.L./ac. of F.Y.M. 5 weeks before flowering. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19''. (x) 23.6.1950 to 30.6.1950.

2. TREATMENTS :

Age of seedlings at transplanting.

- A₁ 8 weeks.
 A₂ 9 weeks.
 A₃ 10 weeks.
 A₄ 11 weeks.
 A₅ 12 weeks.
 A₆ 13 weeks.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) $22' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest, no. of leaves, length, breadth and height of leaves, rope weight. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1130 lb./ac.
 (ii) 200.7 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
A ₁	1196
A ₂	1069
A ₃	1171
A ₄	1035
A ₅	1270
A ₆	1038
S.E./mean	= 81.94 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(4).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out the best age for transplanting of seedlings.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with *raja* plough, 5 *desi* ploughings, 1 disc harrowing and 7 plankings. (b) and (c) N.A. (d) 1' x 1½'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. five weeks before plantings. (vi) T.21 (medium). (vii) Irrigated. (viii) one gap filling, two hoeings, two toppings and suckering. (ix) 0.91". (x) 26.6.1951.

2. TREATMENTS :

Age of seedlings at transplanting : A₁=8 week old, A₂=9 week old, A₃=10 week old, A₄=11 week old, A₅=12 week old, A₆=13 week old.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 7½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest (iv) (a) 1950 to 1952 (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 554.4 lb./ac.
 (ii) 129.87 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
A ₁	478.0
A ₂	557.2
A ₃	543.1
A ₄	599.7
A ₅	528.9
A ₆	619.5
S.E./mean	= 53.02 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(83).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find best age for transplanting of seedlings.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 26.2.1952. (iv) (a) 1 tractor ploughing, 9 ploughings, and 8 plankings. (b) N.A. (c) 8-10 lb./ac. (d) 12" x 15". (e) N.A. (v) 200 lb./ac. of N as F.Y.M. a week before planting. (vi) T.21 (medium). (vii) Irrigated. (viii) Twice gap filling, 5 hoeings, two toppings and suckering. (ix) 1.86". (x) 18.6.1952.

2. TREATMENTS :

Age of seedlings at transplanting : A₁=8 week old, A₂=9 week old, A₃=10 week old, A₄=11 week old, A₅=12 week old, A₆=13 week old.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 22' x 7½'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and rope, green wt. in lb., no. of leaves/plant, breadth and length in cm., height in cm., no. of plant at harvest and tobacco yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 630.8 lb./ac.
 (ii) 117.16 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
A ₁	543.1
A ₂	466.7
A ₃	650.6
A ₄	775.0
A ₅	594.0
A ₆	755.2
S.E./mean	=47.83 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 50(35).

Type :- 'C'.

Object :—To find out the optimum seed rate for raising the nursery.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.2.1950/1.3.1950. (iv) (a) 5 ploughings and 7 *sohaga*. (b) N.A. (c) As per treatments. (d) 15"×9". (e) N.A. (v) 24 C.L./ac. of F.Y.M. 9 weeks before plantings. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 1.19", (x) 24.6.1950 to 30.6.1950.

2. TREATMENTS :

Seed rate/marla : S₁=½ oz., S₂=1 oz., S₃=2 oz., S₄=4 oz., S₅=6 oz., and S₆=8 oz.

3. DESIGN :

- (i) R B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22'×7½'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Growth height, no. of plants at harvest, rope weight. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 973 lb./ac.
 (ii) 219.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
S ₁	1078
S ₂	1007
S ₃	950
S ₄	1021
S ₅	1001
S ₆	781
S.E./mean	= 89.6 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 51(3).

Type :- 'C'.

Object :—To find out the optimum seed rate for raising the nursery.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 22.2.1951. (iv) (a) 1 ploughing with *raja* plough, 5 *desi* ploughings, disc harrowing and 7 plankings. (b) and (c) N.A. (d) 1'×1½'. (e) As per treatments. (v) 200 lb./ac. of N in F.Y.M. five weeks before planting. (vi) T-21 (medium). (vii) Irrigated. (viii) Twice gap filling, one hoeing and one topping. (ix) 0.91". (x) 18.6.1951.

2. TREATMENTS :

Seed rate/marla : $S_1=0.13$ oz., $S_2=0.25$ oz., $S_3=0.5$ oz., $S_4=1$ oz., $S_5=2$ oz., $S_6=4$ oz., $S_7=6$ oz., and $S_8=8$ oz.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) $22' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of stalk and ropes, green wt., number of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 582.7 lb./ac.
- (ii) 106.17 lb./ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
S_1	608.1
S_2	622.3
S_3	676.0
S_4	636.4
S_5	517.6
S_6	526.1
S_7	591.2
S_8	483.7
S.E./mean	= 43.34 lb./ac.

Crop :- Tobacco,

Site :- Agri. Stn., Ferozepur Cantt.

Ref :- Pb. 52(82).

Type :- 'C'.

Object :- To find out the optimum seed rate for raising nursery.

1. BASAL CONDITIONS

(i) (a) Tobacco—Fallow—Wheat—Fodder. (b) Fodder. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 26.2.1952 (iv) (a) 1 tractor ploughing, 9 ploughings and 8 plankings. (b) N.A. (c) As per treatments. (d) $1' \times 1\frac{1}{2}'$. (e) N.A. (v) 200 lb./ac. of N in F.Y.M. applied five weeks before planting by broadcast. (vi) T-21 (medium) (vii) Irrigated. (viii) Twice gap filling, 5 hoeings, 2 toppings and suckering. (ix) 1.86". (x) 18.6.1952.

2. TREATMENTS :

Seed rate/marla : $S_1=0.13$ oz., $S_2=0.25$ oz., $S_3=0.5$ oz., $S_4=1$ oz., $S_5=2$ oz., $S_6=4$ oz., $S_7=6$ oz., $S_8=8$ oz.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) $22' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt. in lb., no. of leaves/plant, breadth and length of leave in cm., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 687.3 lb./ac.
- (ii) 176.45 lb./ac.
- (iii) Treatments are significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
S ₁	724.1
S ₂	681.7
S ₃	834.4
S ₄	738.3
S ₅	667.5
S ₆	588.3
S ₇	577.0
S ₈	687.3
S.E./mean	=72.03 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(52).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object — To find the best spacing and method of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 17.3.1950. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 1 oz./*marla*. (d) As per treatments. (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings (ix) 1.19°. (x) 23.5.1950 and 26.5.1950.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(i) 2 methods of planting : R=Ridge and F=Flat.

(2) 3 spacings between rows : D₁=1', D₂=1½' and D₃=1½'.

Sub-plot treatments :

4 spacings and within rows : S₁=6", S₂=9", S₃=12" and S₄=15".

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'×15'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 893 lb./ac.

(ii) (a) 322.4 lb./ac.

(b) 127.4 lb./ac.

(iii) Only S effect is highly significant, while all others are not significant.

(iv) Av. yield of tobacco in lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean	D ₁	D ₂	D ₃
R	1028	873	803	803	877	885	784	961
F	986	908	875	865	909	985	884	856
Mean	1007	891	839	834	893	935	834	909
D ₁	1052	917	886	887				
D ₂	939	821	778	798				
D ₃	1031	933	853	818				

S.E. of F or R marginal means

=46.5 lb./ac.

S.E. of S marginal means

=26.0 lb./ac.

S.E. of D marginal means

=57.0 lb./ac.

S.E. of difference of two

1. S means at a level of D

=63.7 lb./ac.

2. D means at a level of S

=97.7 lb./ac.

3. S means at a level of Method

=52.0 lb./ac.

4. Method marginal means at a level of S

=79.7 lb./ac.

5. Means in the body of Method × D

=80.5 lb./ac.

Corp :- Tobacco.

Ref :- Pb. 51(19).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :-To find best spacing and method of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 8,9,3.1951. (iv) (a) 1 plough with *raja* plough, 5 *desi* ploughings, 6 plankings and 1 roller. (b) and (c) N.A. (d) As under tree treatments. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. broadcast a month before planting. (vi) T 26 *N-rusti* (vii) Irrigated. (viii) N.A. (ix) 0.91". (x) N.A.

2. TREATMENTS:

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of planting : R=Ridge and F=Flat.

(2) 3 spacings between rows : $D_1=1'$; $D_2=1\frac{1}{2}'$ and $D_3=1\frac{1}{2}'$.

Sub-plot treatments :

4 spacings within rows : $S_1=6"$, $S_2=9"$, $S_3=12"$ and $S_4=15"$.

3. DESIGN :

(i) (a) Split-plot. (ii) (a) 6 main-plots/block : 4 sub-plots/main-plot. (b) N.A. (ii) 4. (iv) (a) N. (b) Main-plot $60' \times 15'$; sub-plot $15' \times 15'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tobacco yield. (iv) (a) 1950—1952. (b) No (c) Nil. (v) (a) a (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 475.35 lb./ac.
(ii) (a) 311.56 lb./ac.
(b) 148.90 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of tobacco in lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean	F	R
D ₁	579.4	581.2	522.5	655.5	584.7	630.6	538.7
D ₂	510.3	526.3	399.1	407.2	460.7	470.5	450.9
D ₃	404.3	409.2	352.0	357.4	380.7	417.0	344.5
Mean	498.0	505.6	424.5	473.4	475.4		
F	484.0	557.4	427.7	555.0	506.0		
R	512.0	453.7	421.4	391.7	444.7		

S.E. of D marginal means = 55.1 lb./ac.

S.E. of S marginal means = 30.4 lb./ac.

S.E. of F or R marginal means = 45.0 lb./ac.

S.E. of difference of two

1. S means at a level of D = 74.4 lb./ac.

2. D means at a level of S = 101.1 lb./ac.

3. S means at a level of Method = 60.8 lb./ac.

4. Method means at a level of S = 82.6 lb./ac.

5. means in the body of D × Method table = 77.9 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(93).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out best spacing and method of planting for Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 25.2.1952. (iv) (a) Tractor ploughing, 6 *sohaga*, 3 rolling and 1 *triphally*. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) F.Y.M. broadcast at 300 lb./ac. of N 3 weeks before planting (vi) T.26 (medium). (vii) Irrigated. (viii) 7 toppings, suckering, one gap filling and 4 hoeings. (ix) 1.86". (x) 13,14.5.1952.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of plantings : R=Ridge and F=Flat.

(2) 3 spacings between rows : $D_1=1'$, $D_2=1\frac{1}{4}'$ and $D_3=1\frac{1}{2}'$.

Sub-plot treatments :

4 spacings within rows : $S_1=6''$, $S_2=9''$, $S_3=12''$ and $S_4=15''$.

3. DESIGN :

(i) Split-plot. (ii) (a) 6 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Main-plot $30' \times 30'$ Sub-plot $15' \times 15'$ (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt., no. of leaves/plant, breadth and length of leaves in cms., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1071 lb./ac.

(ii) (a) 256.5 lb./ac.

(b) 219.7 lb./ac.

(iii) Main effect of S is highly significant. Methods and spacings effects are highly significant while their interaction is not significant.

(iv) Av. yield of tobacco in lb./ac.

	S_1	S_2	S_3	S_4	Mean	F	R
D_1	1364	1283	1099	1058	1201	1337	1065
D_2	1269	1126	1022	870	1072	1264	879
D_3	1131	932	951	743	939	1143	736
Mean	1255	1114	1024	890	1071		
F	1507	1228	1205	1052	1248		
R	1002	999	843	729	893		

S.E. of S marginal mean = 44.8 lb./ac.

S.E. of D marginal mean = 45.3 lb./ac.

S.E. of F or R marginal mean = 37.0 lb./ac.

S.E. of difference of two

1. S means at a level of D = 109.8 lb./ac.

2. D means at a level of S = 114.7 lb./ac.

3. Method means at a level of S = 93.7 lb./ac.

4. S means at a level of Method = 89.7 lb./ac.

5. means of the body of D \times Method table = 64.1 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49 (47).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'C'.

Object :—To study the best time of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As under treatments. (iv) (a) 6 ploughings and 8 *sohaga*. (b) N.A. (c) 3/4 oz./*marla*. (d) Row to row 2', plant to plant 1'. (e) N.A. (v) 24 C.L. of F.Y.M. (vi) T-12 (medium). (vii) Irrigated. (viii) 6—7 toppings and suckering; 4—5 hoeings. (ix) 5.87". (x) 16.6.1949 to 24.7.1949.

2. TREATMENTS :

Dates of planting : $D_1=15.2.1949$, $D_2=22.2.1949$, $D_3=1.3.1949$, $D_4=8.3.1949$, $D_5=15.3.1949$, $D_6=22.3.1949$, $D_7=29.3.1949$, $D_8=5.4.1949$ and $D_9=12.4.1949$.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 55' × 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) The early sown crop had better growth than late sown. The stand of late sown crop was poor due to excessive heat. No lodging. (ii) No. (iii) Rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1201 lb./ac.
 (ii) 164.4 lb./ac.
 (i) Treatment differences are highly significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
D_1	1612
D_2	1534
D_3	1531
D_4	1510
D_5	1443
D_6	1093
D_7	764
D_8	728
D_9	592
S E./mean	= 67.1 lb./ac.

Crop :- Tobacco (*Kharif*).

Ref :- Pb. 50 (45).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'C'.

Object :—To find the best date when seedling should be transplanted.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) As under treatments. (iv) (a) to (e) N.A. (v) 23 C.L./ac. of F.Y.M. one month before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6—7 toppings and suckering, and 4—5 hoeings. (ix) 1.19". (x) 11.6.1950 to 30.6.1950.

2. TREATMENTS :

Date of planting : $D_1=15.2.1950$, $D_2=22.2.1950$, $D_3=2.3.1950$, $D_4=8.3.1950$, $D_5=15.3.1950$, $D_6=22.3.1950$, $D_7=29.3.1950$, $D_8=5.4.1950$ and $D_9=12.4.1950$.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) and (b) 27' × 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Setting good, condition satisfactory. No lodging. (ii) Nil. (iii) Growth, no. of plants at harvest and rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1132 lb./ac.
 (ii) 269.8 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
D ₁	1305
D ₂	1316
D ₃	1295
D ₄	1269
D ₅	1486
D ₆	1317
D ₇	1088
D ₈	477
D ₉	638
S.E./mean	= 95.4 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(11).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'C'.

Object :—To find out the best date when the seedlings should be transplanted.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Fallow-Wheat-Fodder. (b) *Chari*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) one ploughing, with *raja* plough, 8 *desi* ploughings, 1 disc harrowing, 1 planking, and 2 rollers. (b) and (c) N.A. (d) 15"×12". (v) F.Y.M. at 200 lb./ac. of N. (vi) T.21 (medium). (vii) Irrigated. (viii) 4 toppings and suckering, 4 hoeings and one gap filling. (ix) 0.91". (x) 18.6.1951.

2. TREATMENTS :

Dates of transplanting : D₁=15.2.1951. D₂=22.2.1951. D₃=1.3.1951. D₄=8.3.1951. D₅=15.3.1951.
 D₆=22.3.1951. D₇=29.3.1951. D₈=5.4.1951. D₉=12.4.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) and (b) 27'×10' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 659.8 lb./ac.
 (ii) 193.2 lb./ac.
 (iii) Treatments differ highly significantly.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
D ₁	1134.4
D ₂	906.2
D ₃	888.0
D ₄	1092.9
D ₅	767.5
D ₆	632.6
D ₇	242.4
D ₈	175.0
D ₉	99.2
S.E./mean	=68.3 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(49).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :—To find the best date when seedlings should be transplanted.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As under treatments. (iv) (a) 6 ploughings, 6 *sohaga*. (b) N.A. (c) 1 oz/*marla*. (d) 12" × 9". (e) N.A. (v) 21 C.L./ac. of F.Y.M (vi) T—26. (vii) Irrigated. (viii) 6-7 toppings and suckering, 4-5 hoeings. (ix) 1.19". (x) 23.5.1950 and 26.5.1950.

2. TREATMENTS :

4 dates of planting : $D_1=22.2.1950$, $D_2=1.3.1950$, $D_3=8.3.1950$, $D_4=15.3.1950$.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 22' × 10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest and yield. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 933.8 lb./ac.
 (ii) 167.17 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
D_4	839.1
D_2	978.6
D_3	896.1
D_4	1021.3
S.E./mean	=74.76 lb./ac.

Crop :- Tobacco.

Ref :- Pb.51(22).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :—To find the best date when seedlings should be transplanted.

1. BASAL CONDITIONS

(i) (a) Tobacco-Fallow-Wheat-Fodder. (b) Maize (fodder), (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing with *raja* plough 5 *desi* ploughs, 7 plantings and 2 rollers. (b) and (c) N.A. (d) 1' × 1'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. on 15.2.1951. (vi) T-16 (*N-Rustica*). (vii) Irrigated. (viii) N.A. (ix) 0.91". (x) 16.6.1951.

2. TREATMENTS :

11 dates of planting : $D_1=1.2.1951$, $D_2=8.2.1951$, $D_3=15.2.1951$, $D_4=22.2.1951$, $D_5=1.3.1951$, $D_6=8.3.1951$, $D_7=15.3.1951$, $D_8=22.3.1951$, $D_9=29.3.1951$, $D_{10}=5.4.1951$ and $D_{11}=12.4.1951$.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 5. (iv) (a) and (b) 22' × 10'. (v) Nil. (vi) Yes.

4. GENERAL :-

(i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cms., Height in cms., no. of plants at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 846.2 lb./ac.
(ii) 206.85 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
D ₁	1235.2	D ₇	623.3
D ₂	1368.1	D ₈	613.7
D ₃	1244.8	D ₉	419.2
D ₄	983.0	D ₁₀	393.4
D ₅	1315.6	D ₁₁	217.2
D ₆	894.3		

S.E./mean = 92.5 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(95).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find the best date when seedlings should be transplanted

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Potato. (c) 50 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments.
(iv) (a) 7 ploughings, 6 *sohaga* and 1 *triphally*. (b) N.A. (c) 2 ozs./marla. (d) 12" x 9". (e) N.A. (v) 100 lb./ac. of F.Y.M. broadcast on 22.1.1952. 50 lb./ac. of N as A/S applied in between rows by broadcast on 23.4.1952. (vi) T-26 (medium). (vii) Irrigated. (viii) 6 toppings and suckering, 5 hoeings. (ix) 1.86". (x) 12.6.1952.

2. TREATMENTS :

- 11 dates of planting : D₁=1.2.1952, D₂=8.2.1952, D₃=15.2.1952, D₄=22.2.1952, D₅=29.2.1952, D₆=7.3.1952, D₇=14.3.1952, D₈=21.3.1952, D₉=28.3.1952, D₁₀=4.4.1952, D₁₁=11.4.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 22' x 12'. (b) 22' x 10'. (v) 1' each side of the breadth left as foot path. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, Green wt. in lb., no. of leaves/plant, breadth and length of leaves in cms., height in cms., no of plants at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii).

5. RESULTS :

- (i) 1030.3 lb./ac.
(ii) 248.77 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
D ₁	1187.6	D ₇	976.7
D ₂	1113.5	D ₈	1289.4
D ₃	1256.4	D ₉	849.0
D ₄	1293.8	D ₁₀	613.0
D ₅	1450.4	D ₁₁	154.8
D ₆	1148.7		

S.E./mean = 101.6 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(29).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out the best time of planting of *N-rustica*.

1. BASAL CONDITIONS :

(i) (a) Tobacco-Wheat-Guara. (b) Guara. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing with *raja* plough, 7 *desi* ploughings, 9 plankings, and 1 horse hoe. (b) and (c) N.A. (d) 1'×9". (e) N.A. (v) Nil. (vi) T-26 (medium). (vii) Irrigated. (viii) 3 hoeings. (ix) 0.34" to 1". (x) 23.5.1953 to 16.6.1953.

2. TREATMENTS :

11 dates of planting : D₁=1.2.1953, D₂=8.2.1953, D₃=15.2.1953, D₄=22.2.1953, D₅=1.3.1953, D₆=8.3.1953, D₇=15.3.1953, D₈=22.3.1953, D₉=29.3.1953, D₁₀=5.4.1953 and D₁₁=12.4.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 22'×12½'. (b) 22'×10'. (v) One row on either side of length. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Length and breadth of leaf. Av. height of plants, no. of leaves, green plant weight, dry weight, no. of plants, at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) Nil. (b) . (vi) and (vii) Nil.

5. RESULTS :

(i) 564.1 lb./ac.
 (ii) 333.87 lb./ac.
 (iii) Treatment differences are highly significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
D ₁	804.0	D ₇	477.3
D ₂	984.3	D ₈	303.4
D ₃	1107.4	D ₉	112.4
D ₄	937.7	D ₁₀	114.6
D ₅	651.3	D ₁₁	91.2
D ₆	621.6		
	S.E./mean		=136.3 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50 (56).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find the effect of topping and suckering on the yield and quality of Tobacco.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Maize (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 4.3.1950. (iv) (a) 6 ploughings and 6 *sohaga*. (c) 1 oz./marla. (d) 1'×9". (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) As under treatments. (ix) 1.19". (x) 23.5.1950, 26.5.1950.

2. TREATMENTS :

Main-plot treatments :

2 cultural operations : C₁=Topping and C₂=Topping and suckering.

Sub-plot treatments :

3 stages of operation : S₁=at 8 leaf stage, S₂=at 10 leaf stage and S₃=at flowering stage.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 9. (iv) (a) N.A. (b) 22'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) 1950 to (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 361.3 lb./ac.
 (ii) (a) 146.5 lb./ac.
 (b) 106.5 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of tobacco in lb./ac.

	S ₁	S ₂	S ₃	Mean
C ₁	337.7	416.9	394.9	383.2
C ₂	307.7	339.4	371.1	339.4
Mean	322.7	378.2	383.0	361.3

S.E. of difference of two

1. C marginal means = 39.8 lb./ac.
2. S marginal means = 25.1 lb./ac.
3. S means at the same level of C = 50.2 lb./ac.
4. C means at the same level of S = 57.2 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(21).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find the effect of topping and suckering on yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 21.2.51. (iv) (a) 1 *raja* plough, 6 *desi* ploughings, 9 plankings and 1 horse hoe. (b) and (c) N.A. (d) 2' x 1'. (e) N.A. (v) 100 lb./ac. of N as F.Y.M. on 8.2.1951. (vi) *N-rustica*. T-22. (vii) Irrigated. (viii) One gap filling and 3 hoeings. (ix) 0.91". (x) 10.6.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of suckering : S₁=No suckering and S₂=Suckering.

(2) 3 stages of topping : T₁=Topping at 8 leaf stage, T₂=Topping at 12 leaf stage and T₃=Topping at flowering.

3. DESIGN :

(i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 10½'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant, green wt., length and breadth of leaves in cm., height in cm. and no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 720.6 lb./ac.
 (ii) 121.7 lb./ac.
 (iii) Main effect of S alone is highly significant.

(iv) Av. yield of tobacco in lb./ac.

	S ₁	S ₂	Mean
T ₁	907.4	539.3	723.4
T ₂	803.3	625.4	714.4
T ₃	869.6	578.5	724.1
Mean	860.1	581.1	720.6

S.E. of marginal mean of T = 35.1 lb./ac.
 S.E. of marginal mean of S = 28.7 lb./ac.
 S.E. of body of table = 49.7 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(94).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find the effect of topping and suckering.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 15.2.1952. (iv) (a) 1 tractor ploughing, 6 ploughings, 6 *sohaga*, 3 rollerings and one *triphally*. (b) N.A. (c) 2 oz./marla. (d) 12" × 9". (e) N.A. (v) 100 lb./ac. of N as F.Y.M. on 22.1.1952 and 28.1.1952 by broadcast, 50 lb./ac. of N as A/S broadcast on 23.4.1952. (vi) T-26 (medium). (vii) Irrigated. (viii) 5 hoeings. (ix) 1.86". (x) 1,2.6.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of suckering : S₁=No suckering and S₂=Suckering.(2) 3 stages of topping : T₁=Topping at 8 leaf stage, T₂=Topping at 12 leaf stage and T₃=Topping at flowering.

3. DESIGN :

(i) 2 × 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 22' × 12'. (b) 22' × 10' (v) One foot band on either side of length. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt., no. of leaves/plant, breadth and length of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1307 lb./ac.

(ii) 315.4 lb./ac.

(iii) Main effect of S is highly significant. Others are not significant.

(iv) Av. yield of tobacco in lb./ac.

	S ₁	S ₂	Mean
T ₁	1717	940	1329
T ₂	1516	884	1200
T ₃	1663	1123	1393
Mean	1632	982	1307

S.E. of marginal mean of T = 91.0 lb./ac.
 S.E. of marginal mean of S = 74.3 lb./ac.
 S.E. of body of table = 128.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(39).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To compare the effect of normal vs. over grown seedlings on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22,23.2.1950. (iv) (a) 5 ploughings and 6 *sohaga*. (b) and (c) N.A. (d) $1\frac{1}{2}' \times 9''$. (e) N.A. (v) 24 C.L./ac. of F.Y.M. on 20.12.1949. (vi) T.12 (medium). (vii) Irrigated. (viii) 6-7 topping, suckering and 1 hoeing. (ix) 1.19". (x) 16,25.6.1950.

2. TREATMENTS :

1. Over grown seedling (12-13 weeks old seedlings).
2. Normal grown seedling (10 weeks old seedlings).

3. DESIGN :

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) $22' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Rope weight. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1119 lb./ac.
- (ii) 219.31 lb./ac.
- (iii) Treatment differences are not significant.
- (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
1.	1184
2.	1054
S.E./mean	= 76.87 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49(48).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To study the effect of method of planting and spacing on yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 8,9.3.1949. (iv) (a) 6 ploughings and 8 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) 24 C.L./ac. of F.Y.M. 7 days before planting. (vi) T.12 (medium). (vii) Irrigated. (viii) 6-7 toppings, suckering and 4-5 hoeings. (ix) 5.87". (x) 29.6.1949.

2. TREATMENTS :

Main-plot treatments :

2 methods of planting ; M_1 =Flat and M_2 =Ridges.

Sub-plot treatments :

2 row to row spacings : $D_1=2'$ and $D_2=1\frac{1}{2}'$

Sub-sub-plot treatments :

3 plant to plant spacings : $S_1=9''$, $S_2=12''$ and $S_3=15''$.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 8. (iv) (a) Main-plot : $54' \times 24'$ sub-plot : $54' \times 12'$ sub-sub-plot : $18' \times 12'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Rope weight. (iv) (a) 1949-52. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1541 lb./ac.
 (ii) (a) 511.7 lb./ac.
 (b) 279.5 lb./ac.
 (c) 252.1 lb./ac.
 (iii) Only D effect is significant, while all others are not significant
 (iv) Av. yield of tobacco in lb./ac.

	D ₁	D ₂	Mean	S ₁	S ₂	S ₃
M ₁	1500	1652	1576	1559	1569	1600
M ₂	1442	1572	1507	1587	1514	1421
Mean	1471	1612	1541	1573	1541	1511
S ₁	1439	1706	1573			
S ₂	1457	1625	1541			
S ₃	1517	1504	1511			

S.E. of marginal mean of M = 73.9 lb./ac.
 S.E. of marginal mean of D = 40.3 lb./ac.
 S.E. of marginal mean of S = 44.6 lb./ac.

S.E. of difference of two

1. D means at the same level of M = 80.7 lb./ac.
2. M means at the same level of D = 119.0 lb./ac.
3. S means at the same level of M = 89.1 lb./ac.
4. M means at the same level of S = 127.3 lb./ac.
5. S means at the same level of D = 89.1 lb./ac.
6. D means at the same level of S = 92.5 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(44).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :—To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS :

- (i) (a) As per treatments. (b) As per treatments. (c) 100 lb./ac. of N as A/S (ii) (a) Clay loam. (b) N.A.
 (iii) 6.3.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) T.12 (medium). (vii) Irrigated. (viii) 6—7 toppings, suckering and 4-5 hoeings. (ix) 1.19". (x) 22.6.1950.

2. TREATMENTS :

- T₁ = Tobacco-Maize-Tobacco—200% intensity of cropping.
 T₂ = Tobacco-Potato-Tobacco—200% intensity of cropping.
 T₃ = Tobacco-*Chari* (fodder) Tobacco—100% intensity of cropping.
 T₄ = Tobacco-Fallow-Tobacco-100% intensity cropping.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) and (b) 45'×81'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Satisfactory. No lodging. (ii) Nil. (iii) growth, height, no. of plants at harvest and rope weight. (iv) (a) 1950 to 1953. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1309 lb./ac.
 (ii) 206.0 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
T ₁	1361
T ₂	1468
T ₃	940
T ₄	1467
S.E./mean	=72.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(16).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS :

- (i) (a) As per treatments. (b) As per treatments. (c) 100 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1951. (iv) (a) 1 ploughing with *raja* plough, 6 *desi* ploughings, 8 plankings and 1 rolling. (b) and (c) N.A. (d) 2' x 1½'. (e) N.A. (v) Nil. (vi) T.21 (medium). (vii) Irrigated. (viii) 2 gap fillings, 3 toppings and suckering. (ix) 0.91". (x) 24.6.1951.

2. TREATMENTS :

- T₁ = Tobacco-Fallow-Tobacco—100% intensity of cropping.
 T₂ = Tobacco-*Chari* (fodder)-Tobacco—100% intensity of cropping.
 T₃ = Tobacco-Maize-Tobacco—200% intensity of cropping.
 T₄ = Tobacco-Potato-Tobacco—200% intensity of cropping.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 44.5' x 16'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant, length and breadth of leaves in cm., height in cm., no. of plants at harvest. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1152 lb./ac.
 (ii) 242.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
T ₁	1277
T ₂	925
T ₃	1248
T ₄	1159
S.E./mean	=121.3 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(88).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) As under treatments. (b) As under treatments. (c) 100 lb./ac. of N as A/S. (ii) (a) Heavy loam. (b) N.A. (iii) 26.2.1952. (iv) (a) 6 *desi* ploughings, 5 plankings and 1 Lyalpur hoe. (b) N.A. (c) 10 lb./ac. (d) 1' x 1½'. (e) N.A. (v) Nil. (vi) T-21 (medium). (vii) Irrigated. (viii) One gap filling, two hoeings, one topping and suckering. (ix) 1.86". (x) 21.6.1952.

2. TREATMENTS :

4 crop rotations :

T₁=Tobacco-Fallow-Tobacco—100% intensity of cropping.T₂=Tobacco-Maize-Tobacco—200% intensity of cropping.T₃=Tobacco-Potato-Tobacco—200% intensity of cropping.T₄=Tobacco-*Chari* (fodder)-Tobacco—100% intensity of cropping.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 57.5' x 1.6'. (b) 44' x 16'. (v) N.A. (vi) Yes.

4. GENERAL

(i) Satisfactory. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt. in lbs., no. of leaves/plant, breadth and length of leaves in cm., no. of plants at harvest. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1783 lb./ac.

(ii) 198.2 lb./ac.

(iii) Treatments are significantly different.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
T ₁	1976
T ₂	1688
T ₃	1956
T ₄	1512
S.E./mean	= 99.1 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 53(24).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'C'.

Object :- To find out the effect of different rotations on yield and quality of Tobacco.

1. BASAL CONDITIONS :

(i) (a) As per treatments. (b) As per treatments. (c) 100 lb./ac. of N as A/S. (iii) 21.2.1953. (iv) (a) 1 ploughing with *raja* plough, 4 *desi* ploughings, 4 plankings and 1 rolling. (b) and (c) N.A. (d) 1½' from row to row and 9" from plant to plant. (e) N.A. (v) Nil. (vi) T-21 (late). (vii) Irrigated. (viii) 3 weedings and a hoeing. (ix) 1.37". (x) 23.6.1953.

2. TREATMENTS :

4 crop rotations :

T₁=Tobacco-Maize-Tobacco—200% intensity of cropping.T₂=Tobacco-Potato-Tobacco—200% intensity of cropping.T₃=Tobacco-*Chari* (fodder)-Tobacco—100% intensity of cropping.T₄=Tobacco-Fallow-Tobacco—100% intensity of cropping.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $57\frac{1}{2}' \times 16'$. (b) $44.38' \times 16'$ (v) One row on each side of length. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) No. of plants at harvest, height in centimeters, no. of leaves per plant, average length of leaf in cm., green plant weight, dry weight. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1542 lb./ac.
 (ii) 157.2 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
T ₁	2114
T ₂	1674
T ₃	1296
T ₄	1083
S.E./mean	= 78.6 lb./ac.

Crop :- Tobacco.

Site :- Agri. Stn., Ferozepur. Cantt.

Ref :- Pb. 50(51).

Type :- 'I'.

Object :—To study the effect of stoppage of irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 4.3.1950. (iv) (a) 5 ploughings and 6 *sohaga*. (b) N.A. (c) 1 oz./*marla*. (d) $1' \times 9''$. (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings. (xi) $1.19''$. (x) 26.5.1950.

2. TREATMENTS :

I₁=Weekly irrigations (control).
 I₂=Weekly irrigations up to 15th May and no irrigation after 15th May.
 I₃=Weekly irrigations up to 15th May and one irrigation after 15th May.
 I₄=Weekly irrigations upto 15th May and two irrigations after 15th May.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) $10' \times 10'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Height, no. of plants at harvest and tobacco yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a)—. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 938.1 lb./ac.
 (ii) 120.78 lb./ac.
 (iii) Treatment differences are not significant.
 (iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
I ₁	1008.1
I ₂	946.5
I ₃	1010.9
I ₄	786.9
S.E./mean	= 60.39 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49(50).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'I'.

Object :—To study the effect of stoppage of irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 24,25.2.1949. (iv) (a) 6 ploughings 7 *sohaga* and 1 roller. (b) N.A. (c) 3/4 oz./marla. (d) 1½'×1½'. (e) N.A. (v) F.Y.M. 24 C.L./ac. one week before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings, 1 suckering and 4-5 hoeings. (ix) 5.87". (x) 24.6.1949.

2. TREATMENTS :

I₁=Weekly irrigations (control).I₂=Weekly irrigations upto 15 th May and no irrigation after 15th May.I₃=Weekly irrigations upto 15th May and one irrigation after 15th May.I₄=Weekly irrigations upto 15th May and two irrigations after 15th May.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) and (b) 55'×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Rope weight. (iv) (a) 1949—1951. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1870 lb./ac.

(ii) 165.5 lb./ac.

(iii) Treatment differences are not significant.

(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
I ₁	1794
I ₂	1894
I ₃	1853
I ₄	1938
S.E./mean	= 47.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50 (46).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'I'.

Object :—To find out the effect of stoppage of irrigations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 18.2.1950. (iv) (a) 5 ploughings and 7 *sohaga*. (b) N.A. (c) 3/4 oz./marla. (d) 15"×9". (e) N.A. (v) 28 C.L./ac. of F.Y.M. a week before sowing. (vi) T-12. (vii) Irrigated. (viii) 6—7 toppings and suckering ; 4—5 hoeings. (ix) 1.19". (x) 11.6.1950 to 18.6.1950.

2. TREATMENTS :

I₁=Weekly Irrigations till harvest.I₂=Weekly irrigations upto 15.5.1950 and no additional irrigation.I₃=Weekly irrigations upto 15.5.1950 and one additional irrigation.I₄=Weekly irrigations upto 15.5.1950 and two additional irrigations.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 27'×10'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Growth, height, no. of plants at harvest and rope weight. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1300 lb./ac.
(ii) 194.9 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
I ₁	1435
I ₂	985
I ₃	1291
I ₄	1490
S.E./means	= 68.9 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51 (12).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'T'.

Object :- To find out the effect of stoppage of irrigation.

1. BASAL CONDITIONS :

- (i) (a) Tobacco-fallow-Wheat-fodder. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A.
(iii) 15.2.1951. (iv) (a) 1 ploughing with *raja* plough ; 8 *desi* ploughings, 1 *disc* harrow, 11 plankings and 2 roller. (b) and (c) N.A. (d) 15" x 12". (e) N.A. (v) 200 lb./ac. of $\frac{1}{2}$ N as F.Y.M. on 3, 4.1.1951.
(vi) T-21 (medium). (vii) Irrigated. (viii) 4 toppings and suckering, 4 hoeings and one gap filling. (ix) 0.91".
(x) 18.6.1951.

2. TREATMENTS :

- I₁=Weekly irrigations till harvest (control).
I₂=Weekly irrigations upto 30.4.1951.
I₃=Weekly irrigations upto 30.4.1951 and one additional irrigation.
I₄=Weekly irrigations upto 30.4.1951 and two additional irrigations.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 27' x 10'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Dry wt., pit wt. of stalk and ropes, green wt., no. of leaves/plant length and breadth of leaves in cms., height in cms., and no. of plants at harvest. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 867.6 lb./ac.
(ii) 223.9 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of tobacco in lb./ac.

Treatment	Av. yield
I ₁	1004.7
I ₂	735.1
I ₃	884.1
I ₄	846.6
S.E./mean	=79.2 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 49(49).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'CI'.

Object :- To find the best interval of irrigation as well as method of planting.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 19.2.1949. (iv) (a) 6 ploughings, 7 *sohaga* and 1 roller. (b) As per treatments. (c) to (e) N.A. (v) 24 C.L. of F.Y.M. one week before planting. (vi) T-12 (medium). (vii) Irrigated. (viii) 6-7 toppings and suckering ; 4-5 hoeings. (ix) 5.87".
(x) 14.6.1949.

2. TREATMENTS :**Main-plot treatments**2 irrigation intervals: $I_1=5$, $I_2=7$ and $I_3=9$ days.**Sub-plot treatments :**2 methods of planting: $L_1=Flat$ and $L_2=Ridges$.**3. DESIGN :**(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main plot. (b) N.A. (iii) 6. (iv) (a) and (b) Main-plot: $55' \times 12'$, sub-plot: $55' \times 6'$. (v) Nil. (vi) Yes.**4. GENERAL :**

(i) Good. No lodging. (ii) Nil. (iii) Ropes wt. (iv) (a) Not continued. (b) and (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1333 lb./ac.

(ii) (a) 186.3 lb./ac.

(b) 137.6 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of tobacco in lb./ac.

	L_1	L_2	Méan
I_1	1307	1431	1369
I_2	1295	1386	1341
I_3	1312	1267	1290
Mean	1305	1361	1333

S.E. of marginal mean of I = 53.8 lb./ac.

S.E. of marginal mean of L = 32.4 lb./ac.

S.E. of difference between two L means at the same level of I = 79.4 lb./ac.

S.E. of difference between two I means at the same level of L = 94.5 lb./ac.

Crop :- Tobacco.**Ref :- Pb. 50(50).****Site :- Agri. Stn., Ferozpur Cantt.****Type :- CP.****Object :- To find out the best interval of irrigation and best method of planting.****1. BASAL CONDITIONS :**(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 9 to 13.3.1950. (iv) (a) 5 ploughings and 6 *sohaga*. (b) As per treatments. (c) 1 oz./*marla*. (d) $12' \times 9'$. (e) N.A. (v) 21 C.L./ac. of F.Y.M. on 24.12.1949. (vi) T-26. (vii) Irrigated. (viii) 6-7 toppings and suckering; 4-5 hoeings. (ix) 1.19°. (x) 31.5.1950 to 15.6.1950.**2. TREATMENTS :****Main-plot treatments :**3 irrigation intervals: $I_1=5$, $I_2=7$ and $I_3=9$ days.**Sub-plot treatments :**2 methods of planting: $L_1=Flat$ and $L_2=Ridges$.**3. DESIGN :**(i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Sub-plots: $18' \times 10'$. (v) N.A. (vi) Yes.**4. GENERAL :**

(i) Normal. No lodging. (ii) Nil. (iii) Growth height, no. of plants at harvest and yield. (iv) (a) 1950-1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 629.3 lb./ac.
(ii) (a) 184.6 lb./ac.
(b) 133.2 lb./ac.
(iii) None of the effects is significant
(iv) Av. yield of tobacco in lb./ac.

	L ₁	L ₂	Mean
I ₁	802.7	623.8	713.3
I ₂	578.7	575.6	577.2
I ₃	589.6	605.2	597.4
Mean	657.0	601.5	629.3

S.E. of marginal mean of I	= 65.3 lb./ac.
S.E. of marginal mean of L	= 38.5 lb./ac.
S.E. of difference between two L means at the same level of I	= 94.2 lb./ac.
S.E. of difference between two I means at the same level of L	= 113.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(20).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'CI'.

Object :— To find the best interval of irrigation and best method of planting.

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Maize (fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 8.3.1951. (iv) (a) 8 *desi* ploughings, 9 plankings and 2 roller. (b) As per treatments. (c) —. (d) Row to row 1½', plant to plant 1'. (e) N.A. (v) 200 lb./ac. of N as F.Y.M. by broadcast on 8.2.1951. (vi) *N-rustica* T.186 (medium). (vii) Irrigated. (viii) N.A. (ix) 0.91". (x) 28.5.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of sowing : L₁=Flat and L₂=Ridges.(2) 3 irrigations : I₁=Irrigation after 5 days, I₂=Irrigation after 7 days and I₃=Irrigation after 9 days.

3. DESIGN :

- (i) 2×3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10'×18'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Dry wt. of ropes, no. of leaves/plant green wt., length and breadth of leaves in cms., height in cms., no. of plants at harvest and yield. (iv) (a) 1950—52. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 781.5 lb./ac.
(ii) 181.94 lb./ac.
(iii) Effects of I and L are highly significant. The interaction is not significant.
(iv) Av. yield of tobacco in lb./ac.

	I ₁	I ₂	I ₃	Mean
L ₁	992.8	890.4	752.7	878.6
L ₂	828.6	685.8	538.6	684.3
Mean	910.7	788.1	645.7	781.5

S.E. of marginal mean of I	= 51.52 lb./ac.
S.E. of marginal mean of L	= 42.88 lb./ac.
S.E. of body of table	= 74.27 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(92).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'CI'.

Object :- To find the best interval of irrigation and the best method of planting.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 19.2.1952. (iv) (a) 1 tractor ploughing 6 *sohaga*, 3 roller and 1 *triphally*. (b) N.A. (c) 2 *ozs/marla*. (d) 12" x 9". (e) N.A. (v) 300 lb/ac. of N as F.Y.M. by broadcast on 28.1.1952 and 1.2.1952. (vi) T-26 (medium). (vii) Irrigated. (viii) 7 toppings and suckering, gap filling and 4 hoeings. (ix) 1.86". (x) 13,14.5.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 methods of planting : L₁=Flat and L₂=Ridges.(2) 3 irrigations : I₁=5 days interval, I₂=7 days interval and I₃=9 days interval.

3. DESIGN :

(i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 22' x 10'. (b) 18' x 10'. (v) 1' on breadth sides including buds left out. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Dry wt. of ropes, green wt. in lb., no. of leaves/plant, breadth and length of leaves in cms., height in cms., no. of plants at harvest and yield. (iv) (a) 1950-52. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1029 lb./ac.

(ii) 215.1 lb./ac.

(iii) I effect is not significant. L effect is highly significant, while interaction is significant.

(iv) Av. yield of tobacco in lb./ac.

	I ₁	I ₂	I ₃	Mean
L ₁	1328	938	1320	1195
L ₂	815	926	848	863
Mean	1072	932	1084	1029

S.E. of marginal mean of L = 50.7 lb./ac.

S.E. of marginal mean of I = 62.1 lb./ac.

S.E. of body of table = 87.8 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 50(48).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'CI'.

Object :- To find out the best interval of irrigation, method of planting, spacing between rows and spacing between plants.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 20-21.2.1950. (iv) (a) 5 ploughings, and 6 *sohaga*. (b) N.A. (c) 2 *ozs/marla*. (d) As per treatments. (e) N.A. (v) 24 C.L/ac. of F.Y.M. one week before sowing. (vi) T.12 (medium). (vii) Irrigated. (viii) 4-5 hoeings, topping and suckering. (ix) 1.19". (x) 18.6 1950.

2. TREATMENTS :

Main-plot treatments :

3 intervals of irrigation : $I_1=5$, $I_2=7$ and $I_3=9$ days.

Sub-plot treatments :

2 methods of planting : $L_1=Flat$ and $L_2=Ridge$.

Sub-sub-plot treatments :

2 spacing between rows : $R_1=1\frac{1}{2}'$ and $R_2=2'$.

Sub-sub-sub-plot treatments :

3 spacings between plants : $S_1=9''$, $S_2=12''$ and $S_3=15''$.

3. DESIGN :

(i) split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot. 2 sub-sub-plots/sub-plot ; 3 sub-sub-sub plots/sub-sub-plot. (b) N.A. (iii) 4. (iv) sub-sub-sub-plot. (a) N.A. (b) $18' \times 12'$ (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) growth height, no. of plants, rope wt. and yield. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Nil.

5. RESULTS :

- (i) 2977 lb./ac.
(ii) (a) 446.4 lb./ac.
(b) 1112.1 lb./ac.
(c) 421.2 lb./ac.
(d) 479.7 lb./ac.

(iii) R and S effects are highly significant while interaction $R \times S$ is significant. Others are not significant.
(iv) Av. yield of tobacco in lb./ac.

	L_1	L_2	Mean	R_1	R_2	S_1	S_2	S_3
I_1	2668	3032	2850	2574	3126	3155	2763	2632
I_2	2975	3195	3085	2882	3288	3215	2928	3111
I_3	3076	2918	2996	2910	3083	3286	2854	2850
Mean	2905	3048	2977	2789	3165	3219	2848	2865
S_1	3157	3281	3219	3012	3426			
S_2	2701	2996	2848	2677	3020			
S_3	2862	2867	2865	2678	3051			
R_1	2815	2763	2789					
R_2	2998	3333	3165					

S.E. of I marginal means	= 64.4 lb./ac.
S.E. of L marginal means	= 131.1 lb./ac.
S.E. of R marginal means	= 49.6 lb./ac.
S.E. of S marginal means	= 69.2 lb./ac.
S.E. of difference of two	
1. L means at the same level of I	= 321.0 lb./ac.
2. I means at the same level of L	= 244.6 lb./ac.
3. R means at the same level of I	= 121.6 lb./ac.
4. I means at the same level of R	= 125.3 lb./ac.
5. I means at the same level of S	= 169.6 lb./ac.
6. S means at the same level of I	= 165.8 lb./ac.
7. L means at the same level of R	= 198.2 lb./ac.
8. R means at the same level of L	= 99.3 lb./ac.
9. L means at the same level of S	= 217.1 lb./ac.
10. S means at the same level of L	= 138.5 lb./ac.
11. R means at the same level of S	= 133.1 lb./ac.
12. S means at the same level of R	= 138.5 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 51(15).

Site :- Agri. Stn., Ferozpur Cantt.

Type :- 'CP'.

Object :- To find out the best method of planting on ridges or on flat beds, best spacing between plants and best interval of irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 23.2.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) T-21 (medium). (vii) Irrigated. (viii) N.A. (ix) 0.91". (x) 24.6.1951.

2. TREATMENTS :

Main-plot treatments :

3 intervals of irrigation : $I_1=5$, $I_2=7$ and $I_3=9$ days.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of planting : $L_1=Flat$ and $L_2=Ridge$.(2) 2 spacings between rows : $R_1=1\frac{1}{2}'$ and $R_2=2'$.

Sub-sub-plot treatments :

3 spacings between plants : $S_1=9"$, $S_2=12"$ and $S_3=15"$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) sub-sub-plot. (a) N.A. (b) $18' \times 12'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield data. (iv) (a) 1949 to 1952. (b) No. (c) Nil. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS :

(i) 1104 lb./ac.
(ii) (a) 277.7 lb./ac.
(b) 412.7 lb./ac.
(c) 245.8 lb./ac.
(iii) Sub-plot treatment effects and S effects are significant L x R effect is significant, R effect is highly significant while other effects are not significant.
(iv) Av. yield of tobacco in lb./ac.

	L_1	L_2	Mean	R_1	R_2	S_1	S_2	S_3
I_1	1178	991	1084	1163	1006	1147	1095	1009
I_2	1252	920	1086	1195	977	1204	1005	1048
I_3	1123	1159	1141	1244	1038	1223	1080	1121
Mean	1184	1023	1104	1201	1007	1191	1060	1059
S_1	1267	1116	1191	1247	1135			
S_2	1172	948	1060	1164	957			
S_3	1112	1006	1059	1191	928			
R_1	1262	1140	1201					
R_2	1106	905	1007					

S E. of I marginal means = 40.1 lb./ac.
S.E. of S marginal means = 35.5 lb./ac.
S.E. of R or L marginal means = 48.6 lb./ac.
S.E. of difference of two
1. L or R means at the same level of I = 119.1 lb./ac.
2. I means at the same level of L or R = 101.5 lb./ac.
3. S means at the same level of I = 86.9 lb./ac.
4. I means at the same level of S = 90.8 lb./ac.
5. S means at the same level of L or R = 70.9 lb./ac.
6. L or R means at the same level of S = 89.9 lb./ac.
7. means of body of L x R table = 97.3 lb./ac.

Crop :- Tobacco.

Ref :- Pb. 52(87).

Site :- Agri. Stn., Ferozepur Cantt.

Type :- 'CI'.

Object :- To find out the best method of planting, best spacing between plants, and best interval of irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (iii) (a) Heavy loam. (b) N.A. (iii) 6.3.1952. (iv) (a) 1 tractor ploughing, 9 hal, 2 roller and 9 planking. (b) to (e) N.A. (v) 45 C.L./ac. of F.Y.M. on 7.2.1952 to 11.2.1952. by broadcast. (vi) T-21 (medium). (vii) Irrigated. (viii) 2 gap fillings, 4 hoeings, 1 topping and suckering. (ix) 1.86" (x) 24.6.1952 and 26.6.1952.

2. TREATMENTS :

Main-plot treatments :

3 intervals of irrigation : $I_1=5$, $I_2=7$ and $I_3=9$ days.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 methods of planting : $L_1=Flat$ and $L_2=Ridge$.(2) 2 spacings between rows : $R_1=1\frac{1}{2}'$ and $R_2=2'$.

Sub-sub-plot treatments :

3 spacings between plants : $S_1=9"$ $S_2=12"$ and $S_3=15"$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) sub-sub-plot. (a) N.A. (b) $18' \times 12'$. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Dry wt. pit weight of stalk and ropes, green weight, no. of leaves/plant height in cms. no. of plants at harvest. (iv) (a) 1949—1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS

(i) 1112 lb./ac.

(ii) (a) 403.7 lb./ac.

(b) 442.1 lb./ac.

(c) 308.0 lb./ac.

(iii) I effect is highly significant and S effect is significant. Others are not significant.

(iv) Av. yield of tobacco in lb./ac.

	L_1	L_2	Mean	R_1	R_2	S_1	S_2	S_3
I_1	1393	1263	1328	1381	1275	1275	1392	1317
I_2	995	957	976	1056	895	1155	964	809
I_3	1052	1010	1031	1133	929	1145	997	951
Mean	1147	1077	1112	1190	1033	1192	1118	1026
S_1	1222	1162	1192	1271	1113			
S_2	1151	1085	1118	1199	1037			
S_3	1069	983	1026	1101	950			
R_1	1246	1134	1190					
R_2	1047	1019	1033					

S.E. of I marginal means

= 58.3 lb./ac.

S.E. of R or L marginal means

= 52.1 lb./ac.

S.E. of S marginal means

= 44.4 lb./ac.

S.E. of difference of two

1. L or R means at the same level of I

= 127.6 lb./ac.

2. I means at the same level of L or R

= 122.2 lb./ac.

3. S means at the same level of I

= 108.9 lb./ac.

4. I means at the same level of S

= 121.2 lb./ac.

5. S means at the same level of L or R

= 89.0 lb./ac.

6. L or R means at the same level of S

= 103.5 lb./ac.

7. means of body of L x R table

= 62.8 lb./ac.

Crop :-Groundnut.
Site :-Groundnut Expt. Farm, Samrala.

Ref :-Pb. 52(166).
Type :-'M'.

Object :—To find out the response of Groundnut to different doses of A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 14.7.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) F-5. (vii) Unirrigated. (viii) N.A. (ix) 22.19". (x) 15.11.1952.

2. TREATMENTS :

1. Control (no manure).
2. 10 lb./ac. of N as A/S.
3. 20 lb./ac. of N as A/S.
4. 30 lb./ac. of N as A/S.
5. 40 lb./ac. of N as A/S.
6. 50 lb./ac. of N as A/S.

Time and method of application of treatments N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/106th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2060 lb./ac.
(ii) 128.7 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	1888
2.	2017
3.	2115
4.	2131
5.	2044
6.	2162
S.E./mean	=52.5 lb./ac.

Crop:-Groundnut.
Site :-Groundnut Expt. Farm, Samrala.

Ref :-Pb. 53(247).
Type :-'M'.

Object :—To study the response of Groundnut to different doses of A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) Sandy. (b) Refer soil analysis, Samrala. (iii) 27.6.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) F-5. (vii) Unirrigated. (viii) N.A. (ix) 20.16". (x) 16.11.1953.

2. TREATMENTS :

1. Control.
2. 10 lb./ac. of N as A/S.
3. 20 lb./ac. of N as A/S.
4. 30 lb./ac. of N as A/S.
5. 40 lb./ac. of N as A/S.
6. 50 lb./ac. of N as A/S.

Time and method of application of treatments N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/106th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2420 lb./ac.
 (ii) 140.3 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	2212
2.	2553
3.	2463
4.	2494
5.	2390
6.	2412
S.E./mean	= 57.3 lb./ac.

Crop Groundnut.

Ref :- Pb. 49 (83).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'M'.

Object :—To find out the suitability of various artificial fertilizers and organic manures on groundnut yield under rainfed conditions.

1. BASAL CONDITIONS :

- (i) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

- 25 lb./ac. of N as F.Y.M.
- 25 lb./ac. of N as G.N.C.
- 25 lb./ac. of N as A/S.
- 25 lb./ac. of N as Ammo. Phos.
- Control (no manure).

F.Y.M. and G.N.C. applied one week before sowing while A/S and Ammo. Phos. applied after sowing.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/66th ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1823 lb./ac.
 (ii) 269.9 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	1662
2.	1585
3.	2209
4.	2090
5.	1568
S.E./mean	= 110.2 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 50 (92).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'M'.

Object :—To find out the suitability of various artificial fertilizers and organic manures on groundnut yield under rainfed conditions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 30.1". (x) N.A.

2. TREATMENTS :

1. 25 lb./ac. of N as F.Y.M.
2. 25 lb./ac. of N as G.N.C.
3. 25 lb./ac. of N as A/S.
4. 25 lb./ac. of N as Ammo. Phos.
5. Control (no manure).

F.Y.M. and G.N.C. applied ten days before sowing and A/S and Ammo. Phos. applied one month after sowing.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/66th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Av. shelling %, Av. wt. of 100 seeds, pod yield/ac. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1436 lb./ac.
- (ii) 222.0 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	1055
2.	976
3.	1926
4.	2358
5.	866
S.E./mean	= 90.65 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 49(84).

Site :- Groundnut Expt. Farm Samrala.

Type :- 'C'.

Object :—To study the effect of different spacings between rows and plants on yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) a) t⁰ (e) N.A. (v) Nil. (vi) E-4 (erect and bushy). (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 spacings between plants : P₁=6", P₂=9" and P₃=12".
- (2) 2 spacings between rows : R₁=9" and R₂=12".

3. DESIGN:

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/50th ac. (v) N.A. (v) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) 1949-50. (b) and (b) No. (v) (a) and (b) No (vi) and (vii) Nil.

5. RESULTS :

- (i) 1379 lb./ac.
(ii) 155.7 lb./ac.
(iii) Main effect of R alone is highly significant.
(iv) Av. yield of pod in lb./ac.

	P ₁	P ₂	P ₃	Mean
R ₁	1127	1208	1131	1155
R ₂	1148	983	879	1003
Mean	1137	1095	1005	1079

S.E. of marginal mean of P = 63.6 lb./ac.
S.E. of marginal mean of R = 44.9 lb./ac.
S.E. of body of table = 36.7 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 50(94).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'C'.

Object :- To study the effect of different spacings between rows and plants on yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) E-4 (erect and bushy). (vii) Unirrigated. (viii) N.A. (ix) 30.8". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 spacings between plants : P₁=6", P₂=9" and P₃=12".
(2) 2 spacings between rows : R₁=9" and R₂=12".

3. DESIGN :

- (i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair to good. No lodging. (ii) Nil. (iii) No. of plants/plot, seed rate/ac., pod yield. (iv) (a) 1949-50. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 831 lb./ac.
(ii) 199.9 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of pod in lb./ac.

	P ₁	P ₂	P ₃	Mean
R ₁	934	868	862	888
R ₂	862	724	737	774
Mean	898	796	800	831

S.E. of marginal mean of R = 81.6 lb./ac.
S.E. of marginal mean of P = 47.1 lb./ac.
S.E. of body of table = 57.7 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 49(85).

Site :- Groundnut Expt. Farm., Samrala.

Type :- 'C'.

Object :- To study the effect of different spacings between rows and plants on yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) Samrala selection (spreading type). (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings between plants : $P_1=9''$, $P_2=12''$, $P_3=18''$ and $P_4=24''$,(2) 2 spacings between rows : $R_1=9''$ and $R_2=12''$.

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1367 lb./ac.

(ii) 207.2 lb./ac.

(iii) Main effect of P and interaction P R are significant.

(iv) Av. yield of pod in lb./ac.

	P_1	P_2	P_3	P_4	Mean
R_1	1529	1395	1348	1349	1403
R_2	1436	1333	1389	1162	1330
Mean	1483	1364	1369	1251	1367

S.E. of marginal mean of P = 59.8 lb./ac.

S.E. of marginal mean of R = 42.3 lb./ac.

S.E. of body of table = 84.6 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 50(93).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'C'.

Object :- To study the effect of different spacings between rows and plants on yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No 1. (vii) Unirrigated. (viii) N.A. (ix) 30.3%. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 spacings between plants : $P_1=9''$, $P_2=12''$, $P_3=18''$ and $P_4=24''$.(2) 2 spacings between rows : $R_1=9''$ and $R_2=12''$.

3. DESIGN :

(i) 4×2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) No. of plants/plot, seed rate/ac. pod yield, (iv) (a) 1949-1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1228 lb./ac.
 (ii) 200.7 lb./ac.
 (iii) Effect of P alone is highly significant.
 (iv) Av. yield of pod in lb./ac.

	P ₁	P ₂	P ₃	P ₄	Mean
R ₁	1303	1285	1261	1052	1225
R ₂	1495	1190	1255	981	1230
Mean	1399	1238	1258	1017	1228

S.E. of marginal mean of P = 57.9 lb./ac.

S.E. of marginal mean of R = 41.0 lb./ac.

S.E. of body of table = 81.9 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 51(38).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'CM'.

Object :—To study the effect of application of N and P₂O₅ and spacing between plants on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 24.7.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 19.45". (x) 12.12.1951.

2. TREATMENTS :

Main-plot treatments :

3 spacings between plants : S₁=9", S₂=18" and S₃=24".

Sub-plot treatments :

All combinations of (1) and (2).

(1) 3 levels of N : N₀=Control, N₁=25 lb./ac. and N₂=50 lb./ac.

(2) 3 levels of P₂O₅ : P₀=Control, P₁=25 lb./ac. and P₂=50 lb./ac.

Source of N is A/S and that of P₂O₅ is Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1782 lb./ac.
 (ii) (a) 229.2 lb./ac.
 (b) 303.9 lb./ac.
 (iii) Only main-plots are significantly different, while all others are not significant.

(iv) Av. yield of pod in lb./ac.

	P ₀	P ₁	P ₂	Mean	N ₀	N ₁	N ₂
S ₁	2127	2177	2147	2150	2253	2222	1976
S ₂	1696	1843	1800	1780	1959	1709	1671
S ₃	1495	1410	1343	1416	1416	1384	1448
Mean	1773	1810	1763	1782	1876	1772	1698
N ₀	1720	1922	1985	1876			
N ₁	1814	1782	1720	1772			
N ₂	1785	1725	1585	1698			

S.E. of difference of two

1. S marginal means = 62.4 lb./ac.
2. N or P marginal means = 82.7 lb./ac.
3. N or P means at a level of S = 143.3 lb./ac.
4. S means at a level of N or P = 132.6 lb./ac.
- S.E. of body of N×P table = 76.4 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 52(165).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'CM'.

Object :—To study the effect of applications of N and P₂O₅ and spacing between plants on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 15.7.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 22.19". (x) 20.11.1952.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2).

(1) 3 levels of N : N₀=Control, N₁=25 lb./ac. and N₂=50 lb./ac.(2) 3 levels of P₂O₅ : P₀=Control, P₁=25 lb./ac., and P₂=50 lb./ac.

Sub-plot treatments :

3 spacings between plant : S₁=9" S₂=18" and S₃=24"Source of N is A/S and that of P₂O₅ is Super.

3. DESIGN .

(i) Split-plot. (ii) (a) 9 main-plots/block ; 3 sub-plots/main-plot. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1954. (b) No (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 973 lb./ac.

(ii) (a) 292.8 lb./ac.

(b) 175.3 lb./ac.

(iii) Only sub-plot treatment effect is highly significant, while all other treatments and their interactions are not significant.

J. 2, 9 N: S. N6
103764 K2.11.1.

(iv) Av. yield of pod in lb./ac.

	S ₁	S ₂	S ₃	Mean	P ₀	P ₁	P ₂
N ₀	1084	926	661	890	748	983	940
N ₁	1233	988	740	987	1058	878	1025
N ₂	1330	1003	796	1043	958	1032	1140
Mean	1216	972	732	973	921	964	1035
P ₀	1172	920	671				
P ₁	1204	975	713				
P ₂	1271	1022	813				

S.E. of difference of two

- | | |
|---------------------------------|---------------|
| 1. N or P marginal means | =69.0 lb./ac. |
| 2. S marginal means | =41.3 lb./ac. |
| 3. S means at a level of N or P | =71.5 lb./ac. |
| 4. N or P means at a level of S | =90.4 lb./ac. |
| S.E. of body of N×P table | =84.5 lb./ac. |

Crop :-Groundnut.

Ref :-Pb. 53(142).

Site :-Groundnut Expt. Farm, Samrala.

Type :-'CM'.

Object :—To study the effect of manure and spacing on yield of Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 27.6.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 20.16". (x) 20.11.1953.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N : N₀=Control, N₁=25 lb./ac. of N as A/S and N₂=50 lb./ac. of N as A/S.(2) 3 levels of P₂O₅ : P₀=Control, P₁=25 lb./ac. of P₂O₅ as Super. and P₂=50 lb./ac. of P₂O₅ as Super.

Sub-plot treatments :

3 spacings between plants : S₁=9" S₂=18" S₃=27"

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 54'×10'. (b) 45'×8'. (v) 4½' on length side and 1' on breadth side each. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) 1951—1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) Plot wise yield not available.

5. RESULTS :

(i) 1639 lb./ac.

(ii) (a) 54.12 lb./ac.

(b) 86.53 lb./ac.

(iii) Interaction PS is significant. All other effects and interactions are highly significant.

(iv) Av. yield of pod in lb./ac.

	S ₁	S ₂	S ₃	Mean	P ₀	P ₁	P ₂
N ₀	1737	1681	1343	1587	1455	1721	1585
N ₁	1734	1659	1444	1612	1657	1575	1606
N ₂	1860	1714	1580	1718	1654	1695	1804
Mean	1776	1684	1461	1639	1588	1664	1665
P ₀	1773	1620	1372	1588			
P ₁	1756	1743	1492	1664			
P ₂	1802	1690	1580	1665			

S.E. of difference of two

1. N or P marginal means =12.76 lb./ac.
2. S marginal means =20.39 lb./ac.
3. S means at the same level of N or P =20.39 lb./ac.
4. N or P means at the same level of S =18.21 lb./ac.
5. means in body of N×P table =22.09 lb./ac.

Crop :-Groundnut.

Ref :-Pb. 51(128).

Site :-Groundnut Expt. Farm, Samrala.

Type :-'CMV'.

Object :—To study the response of different varieties of Groundnut to different doses of N and different spacings.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) Sandy. (b) Refer soil analysis, Samrala. (iii) 26.7.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 19.45°. (x) 7.12.1951.

2. TREATMENTS :

Main-plot treatments :

6 levels of N : N₀=0, N₁=10, N₂=20, N₃=30, N₄=40, N₅=50 lb./ac. of N.

Sub-plot treatments :

2 spacings between plants : S₁=12" and S₂=9".

Sub-sub-plot treatments :

2 varieties : V₁=Punjab Groundnut 1 and V₂=Philippine pink.

Source of N is A/S.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) No. (b) and (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1203 lb./ac.
- (ii) (a) 204.0 lb./ac.
- (b) 192.2 lb./ac.
- (c) 106.7 lb./ac.
- (iii) Main-plots, sub-plots and sub-sub-plots treatment effects are highly significantly different, while all others are not significant.

(iv) Av. yield of pod in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	N ₅	Mean	V ₁	V ₂
S ₁	1223	1041	1012	1152	1319	1103	1142	1225	1059
S ₂	1407	1018	1120	1355	1440	1246	1264	1310	1219
Mean	1315	1030	1066	1254	1380	1175	1203	1267	1139
V ₁	1368	1116	1113	1322	1469	1216	1267		
V ₂	1261	944	1018	1185	1291	1133	1139		

S E. of difference of two

1. N marginal means =72.1 lb./ac.
2. S marginal means =39.2 lb./ac.
3. V marginal means =21.8 lb./ac.
4. S means at the same level of N =96.1 lb./ac.
5. N means at the same level of S =99.1 lb./ac.
6. V means at the same level of N =53.4 lb./ac.
7. N means at the same level of V =81.4 lb./ac.
8. V means at the same level of S =30.8 lb./ac.
9. S means at the same level of V =44.9 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 50(95).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'D'.

Object :-To study the effect of spraying the crop with Bordeaux Mixture.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Punjab Groundnut No. 1. (vii) Irrigated. (viii) N.A. (ix) 30.8". (x) N.A.

2. TREATMENTS :

1. Control.
2. One spraying with bordeaux mixture.
3. Two sprayings with bordeaux mixture.

First spray seven weeks after sowing and second 9 weeks after sowing.

3. DESIGN :

(i) R B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) Not contd. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2009 lb./ac.
- (ii) 272.3 lb./ac.
- (iii) Treatment differences are highly significant.
- (iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	1013
2.	2238
3.	2777
S.E./mean	= 157.2 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 51(129).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'D'.

Object :—To study the effect of application of N and spraying with Bordeaux Mixture on Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 26.7.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 19.45". (x) 8.12.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N : $N_0=0$ and $N_1=25$ lb./ac. of N as A/S.(2) 3 levels of spraying : $S_0=$ No spraying, $S_1=$ One spraying with bordeaux mixture (2 : 2 : 40) and $S_2=$ Two sprayings with bordeaux mixture (2 : 2 : 40).

3. DESIGN :

(i) 3×2 Fact. in R.B.D (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 1776 lb./ac.

(ii) 330.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of pod in lb./ac.

	S_0	S_1	S_2	Mean
N_0	1731	1766	1817	1771
N_1	1626	1907	1809	1781
Mean	1679	1837	1813	1776

S.E. of marginal mean of N = 77.8 lb./ac.

S.E. of marginal mean of S = 95.3 lb./ac.

S.E. of body of table = 134.7 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 52 (164).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'D'.

Object :—To study the effect of application of N and sprayings with Bordeaux Mixture on Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 15.7.1952. (iv) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 22.19". (x) 18.11.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N : $N_0=$ Control and $N_1=25$ lb./ac. of N as A/S.(2) 3 levels of sprayings : $S_0=$ No spraying, $S_1=$ One spray and $S_2=$ two sprayings with bordeaux mixture (2 : 2 : 40).

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/106 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 2048 lb./ac.
 (ii) 275.0 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of pod in lb./ac.

	S ₀	S ₁	S ₂	Mean
N ₀	1974	2069	2037	2027
N ₁	2053	2031	2122	2069
Mean	2014	2050	2080	2048

S.E. of marginal mean of S = 79.4 lb./ac.
 S.E. of marginal mean of N = 64.8 lb./ac.
 S.E. of body of table = 112.3 lb./ac.

Crop :- Groundnut.

Ref :- Pb. 53 (248).

Site :- Groundnut Expt. Farm, Samrala.

Type :- 'D'.

Object :—To study the effect of application of N and sprayings with Bordeaux Mixture on Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Samrala. (iii) 27.6.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Punjab Groundnut No. 1. (vii) Unirrigated. (viii) N.A. (ix) 20.16°. (x) 18.11.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N₀=Control and N₁=25 lb./ac. of N as A/S.

(2) 3 levels of sprayings : S₀=No spray, S₁=One spraying and S₂=two sprayings with bordeaux mixture.

3. DESIGN :

(i) 3×2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/106 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Germination counts and pod yield. (iv) (a) 1951 to 1953, (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS

(i) 2394 lb./ac.
 (ii) 270.1 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of pod in lb./ac.

	S ₀	S ₁	S ₂	Mean
N ₀	2242	2390	2499	2377
N ₁	2355	2360	2517	2411
Mean	2299	2375	2508	2394

S.E. of marginal mean of ~ = 78.0 lb./ac.
 S.E. of marginal mean of N = 63.7 lb./ac.
 S.E. of body of table = 110.3 lb./ac.

Crop :- Groundnut.
Site :- Jullundur Agri. Stn., Jullundur.

Ref :- Pb. 53(101).
Type :- 'M'.

Object :- To find the best source of N for Groundnut crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Wheat. (c) A/S at 30 lb./ac. of N on 7.11.1953. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 2,3.7.1953. (iv) (a) 3 *desi hal* and 4 *sohaga*. (b) N.A. (c) 20 seer/ac. (d) and (e) N.A. (v) Nil. (vi) F-15 (medium). (vii) Irrigated. (viii) Hoeing. (ix) 24.61". (x) 24.11.1953, 25.11.1953, 28.11.1953, 3.12.1953 and 8.12.1953.

2. TREATMENTS :

1. Control.
 2. Urban compost 25 lb./ac. of N.
 3. Urban compost 50 lb./ac. of N.
 4. 25 lb./ac. of N as F.Y.M.
 5. 50 lb./ac. of N as F.Y.M.
- Compost and F.Y.M. applied on 28.6.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 108'-9" x 10'. (b) 100.83' x 8'. (v) 1' left out on breadth sides and nearly 4' on length side. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Pod yield. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2572 lb./ac.
(ii) 173.5 lb./ac.
(iii) Treatments are significantly different.
(iv) Av. yield of pod in lb./ac.

Treatment	Av. yield
1.	2418
2.	2475
3.	2571
4.	2777
5.	2621
S.E./mean	= 70.8 lb./ac.

Crop :- *Brassica Compestris* (brown sarson).
Site :- Oilseed Res Stn., Gurgaon.

Ref :- Pb. 52(8).
Type :- 'M'.

Object :- To study the phosphatic requirements of *B-Compestris* with special reference to presence and absence of nitrogen manure.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara* for green manuring. (c) No. (ii) Sandy loam. (b) N.A. (iii) 3.11.1952. (iv) (a) 4 plough and 4 *sohaga*. (b) and (c) N.A. (d) 6" row to row. (e) N.A. (v) *Guara* green manure (vi) Brown *sarson* (medium). (vii) Irrigated. (viii) One hoeing. (ix) 2.27". (x) 7.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 levels of N : N_0 =Control, N_1 =25 lb./ac. of N as A/S and N_2 =50 lb./ac. of N as A/S.
(2) 3 levels of P_2O_5 : P_0 =Control, P_1 =25 lb./ac. of P_2O_5 as Super and P_2 =50 lb./ac. of P_2O_5 as Super.
Manures applied on 4.1.1953.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 66'×10': (b) 64'×8', (v) 1' all round the net plot. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Mild attack of aphid. Two sprayings with agroicide. (iii) Plant height, no. of pods/plant, length of pod. Thousand grain weight and seed yield. (iv) (a) 1952—continuing. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 277.1 lb./ac.
 (ii) 108.54 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of seed in lb /ac.

	P ₀	P ₁	P ₂	Mean
N ₀	154.5	287.1	278.9	240.2
N ₁	244.8	377.4	211.9	278.0
N ₂	335.0	333.9	273.5	313.1
Mean	244.8	331.8	254.8	277.1

S.E. of any marginal mean = 54.27 lb./ac.
 S.E. of body of table = 31.33 lb./ac.

Crop :- *Brassica Campestris* (brown sarson).

Ref :- Pb. 53(12).

Site :- Oilseed Res. Stn., Gurgon.

Type :- 'M'.

Object:—To study the phosphatic requirements of *Brassica campestris* with special reference to the presence and absence of N.

1. BASAL CONDITIONS :

(i) Cotton-Fallow-Sarson. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.10.1953. (iv) (a) 6 ploughings : 2 with *hindustan* and 4 with *desi* plough. 4 levellings with *sohaga*. (b) N.A. (c) 2½ sr. (d) and (e) N.A. (v) Nil. (vi) Brown Sarson 'A' (medium). (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) 7.28". (x) 9.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 levels of N : N₀=0, N₁=30, N₂=60 and N₃=90 lb./ac.
 (2) 3 levels of P₂O₅ : P₀=0, P₁=25 and P₂=50 lb./ac.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 5'×42'. (b) 3'×36'.4". (v) 1 row on each side. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Mild attack of aphid and alternaria. Two sprayings with agroicide. (iii) Height of plant, No. of branches per plant, no. of pods, plant ; length of pod, weight, seed yield. (iv) (a) 1952—continuing. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1414 lb./ac.
 (ii) 128.8 lb./ac.
 (iii) N effect alone is highly significant.

(iv) Av. yield of seed in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1271	1300	1283	1285
N ₁	1438	1363	1500	1434
N ₂	1429	1417	1479	1442
N ₃	1471	1600	1417	1496
Mean	1402	1420	1420	1414

S.E. of marginal mean of P = 30.4 lb./ac.
 S.E. of marginal mean of N = 26.3 lb./ac.
 S.E. of body of table = 52.6 lb./ac.

Crop :- *Sarson*.

Ref :- Pb. 51(30).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'M'.

Object :—To study the best manure for *Sarson*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 28.9.1951. (iv) (a) 1 *raja* plough, 5 *desi* plough, 1 roller and 2 *sohaga*. (b) N.A. (c) 2½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 2.63". (x) 1.3.1952.

2. TREATMENTS :

1. Control.
2. 40 lb./ac. of N as A/S.
3. 40 lb./ac. of P₂O₅ as Super.
4. 40 lb./ac. of N + 40 lb./ac. of P₂O₅ as Ammo. Phos.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11' × 71'-2". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Poor to fair. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 256.5 lb./ac.
- (ii) 42.01 lb./ac.
- (iii) Treatments are highly significant.
- (iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	150.1
2.	343.9
3.	182.9
4.	349.0
S.E./mean	= 17.15 lb./ac.

Crop :- Brown *Sarson* and *Raya*.

Ref :- Pb. 52(12).

Site :- Oilseed Res. Stn., Gurgaon.

Type :- 'MV'.

Object :- To determine optimum dose of N for the *Raya* and *Sarson* crops.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) *Guara* for green manuring. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 4.11.1952. (iv) (a) 1 *hindustan* plough, 3 *desi* plough and 4 *sohaga*. (b) N.A. (c) 1½ *tola*/plot. (d) and (e) N.A. (v) *Guara* green manure. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 2.27". (x) 7.3.1953 to 15.3.1953.

2. TREATMENTS :

Main-plot treatments :

6 levels of N as A/S. : N_0 =Control, N_1 =15 lb./ac. of N, N_2 =30 lb./ac. of N, N_3 =45 lb./ac. of N, N_4 =60 lb./ac. of N and N_5 =75 lb./ac. of N.

Sub-plot treatments :

2 varieties : V_1 =*Raya* L.18, V_2 =*Sarson* brown.

N applied on 4.1.1953.

3. DESIGN ;

(i) Split-plot. (ii) (a) 6 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6'×63.13'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Mild attack of *Aphis*. (iii) Height of plot, no. of branches and pods/plant, length of pod, thousand grain wt. and seed yield (iv) (a) Net continued. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 616.9 lb./ac.

(ii) (a) 137.0 lb./ac.

(b) 86.5 lb./ac.

(iii) Only "varieties" are highly significantly different, while others are not significant.

(iv) Av. yield of seed in lb./ac.

	V_1	V_2	Mean
N_0	676.4	465.7	571.1
N_1	628.4	487.9	558.2
N_2	746.7	480.5	613.6
N_3	643.2	473.1	558.2
N_4	861.3	590.0	725.7
N_5	835.4	513.8	674.6
Mean	731.9	501.8	661.9

S.E. of difference of two

1. N marginal means = 68.5 lb./ac.

2. V marginal means = 25.0 lb./ac.

3. V means at the same level of N=61.2 lb./ac.

4. N means at the same level of V=81.1 lb./ac.

Crop :- *Brassica Compestris* (brown *sarson*).

Ref :- Pb. 52(10).

Site :- Oilseed Res. Stn., Gurgaon.

Type :- 'C'.

Object :- To determine the optimum sowing date and spacing for brown *Sarson*

1. BASAL CONDITIONS :

(i) (a) Cereals-*Guara* for green manuring—Brown *sarson*. (b) *Guara* for green manuring. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 *hindustan* plough, 3 *desi* plough and 4 *sohaga*. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) *Guara* green manure. (vi) Brown *sarson* medium. (vii) Irrigated. (viii) N.A. (ix) 2.27". (x) 6.3.1953.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=12.10.1952$, $D_2=27.10.1952$ and $D_3=11.11.1952$.

Sub-plot treatments :

3 spacings between rows : $R_1=9''$, $R_2=12''$ and $R_3=15''$.

Sub-sub-plot treatments :

2 spacings between plants : $S_1=3''$ and $S_2=6''$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $5' \times 63'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Mild aphid attacks. Two sprayings with agroside. (iii) Height of plant, no. of branches/plant, no. of pods/plant, pod length, thousand grain wt. and seed yield. (iv) (a) 1952 continuing. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 221.5 lb./ac.

(ii) (a) 190.45 lb./ac.

(b) 106.44 lb./ac.

(c) 73.37 lb./ac.

(iii) Main effect of D is highly significant. S and interaction RS are significant. Other are not significant.

(iv) Av. yield of seed in lb./ac.

	R_1	R_2	R_3	Mean	S_1	S_2
D_1	397.8	500.1	364.5	420.8	466.7	374.9
D_2	177.8	150.0	164.5	164.1	171.9	156.3
D_3	101.1	66.7	71.1	79.6	86.7	72.6
Mean	225.6	238.9	200.0	221.5		
S_1	253.4	263.0	208.9	241.8		
S_2	197.8	214.8	191.2	201.3		

S.E. of difference of two

1. D marginal means = 54.96 lb./ac.
2. R marginal means = 30.68 lb./ac.
3. S marginal means = 17.29 lb./ac.
4. R means at the same level of D = 53.22 lb./ac.
5. D means at the same level of R = 70.08 lb./ac.
6. S means at the same level of D = 29.95 lb./ac.
7. D means at the same level of S = 58.92 lb./ac.
8. S means at the same level of R = 29.95 lb./ac.
9. R means at the same level of S = 37.32 lb./ac.

Crop :- *Brassica Compestris*.

Site :- Oilseed Res. Stn., Gurgaon.

Ref :- Pb. 53(13).

Type :- 'C'.

Object :- To determine the optimum sowing date and spacing for brown *Sarson*.

1. BASAL CONDITIONS :

(i) (a) Cotton-Fallow-Sarson. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) Four ploughings (3 with *desi* and one with *hindustan* plough) and four levellings. (b) N.A. (c) $2\frac{1}{2}$ sr./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) B.S.A. (medium). (vii) Irrigated. (viii) Two thorough weedings. (ix) $7.28''$. (x) 23.2.1954 to 5.3.1954.

2. TREATMENTS :

Main-plot treatments :

4 dates of sowing : $D_1=25.9.1953$, $D_2=10.10.1953$, $D_3=25.10.1953$ and $D_4=9.11.1953$.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 spacings between rows : $R_1=9''$, $R_2=12''$, and $R_3=15''$.

(2)-2 spacings between plants : $S_1=3''$ and $S_2=6''$,

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot $42' \times 30'$. (c) Sub-plot $30' \times 6'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Mild aphid attack. Two sprayings with agroicide. (iii) Height of plants, no. of branches per plant, no. of pods per plant, length of pod, thousand grain weight. (iv) (a) 1952—continued. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 867.1 lb./ac.
 (ii) (a) 254.94 lb./ac.
 (b) 105.88 lb./ac.
 (iii) Main effect of D and interactions $D \times R$ and $D \times S$ are highly significant.
 (iv) Av. yield of seed in lb./ac.

	R_1	R_2	R_3	Mean	S_1	S_2
D_1	1470.9	1396.5	1338.6	1402.0	1466.3	1337.7
D_2	1284.4	1333.5	1373.9	1330.6	1278.1	1383.1
D_3	746.2	684.4	663.0	697.9	771.4	624.3
D_4	42.9	29.0	41.6	37.8	47.1	28.6
Mean	886.1	860.8	854.3	867.1	890.7	843.4
S_1	916.3	880.4	875.4	890.7		
S_2	855.8	841.3	833.1	843.4		

S.E. of difference of two

1. D marginal means = 60.08 lb./ac.
2. R marginal means = 21.61 lb./ac.
3. S marginal means = 17.65 lb./ac.
4. R means at the same level of D = 43.23 lb./ac.
5. D means at the same level of R = 69.69 lb./ac.
6. S means at the same level of D = 35.30 lb./ac.
7. D means at the same level of S = 65.07 lb./ac.
8. means in the b. dy of $R \times S$ table = 30.56 lb./ac.

Crop :- *Sarson*.

Ref :- Pb. 52(2).

Site :- Oilseed Res. Stn., (M.A. Farm), Faridkot.

Type :- 'CM'.

Object :- To find out the optimum time of sowing and manurial requirement of *Sarson*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 3 ploughings and 2 *sohaga*. (b) N.A. (c) $2\frac{1}{2}$ 'sr./ac. (d) 1' row to row. (e) N.A. (v) Nil. (vi) *Sarson* brown local (medium). (vii) Irrigated. (viii) 1 weeding and 1 thinning. (ix) 0.76%. (x) 11.3.1953 to 20.3.1953.

2. TREATMENTS :**Main-plot treatments :**

5 dates of sowing : $D_1=23.9.1952$, $D_2=3.10.1952$, $D_3=14.10.1952$, $D_4=26.10.1952$ and $D_5=13.11.1952$.

Sub-plot treatments :

2 levels of N : $N_0=0$ and $N_1=25$ lb./ac. of N as A/S.

N applied at 1st irrigation.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 2 sub-plots/main-plot. (iii) 6. (iv) (a) $8' \times 71'$. (b) $8' \times 64' \cdot 10''$.
(v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good, condition fair. No lodging. (ii) Aphis attack, spraying with DDT on 17.2.1953.
(iii) Height in inches, pod/plant, seed yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1206 lb./ac.
(ii) (a) 244.5 lb./ac.
(b) 104.8 lb./ac.
(iii) Date of sowing effect is highly significant, N effect is not significant while interaction is significant.
(iv) Av. yield of seed in lb./ac.

	N_0	N_1	Mean
D_1	1402	1301	1352
D_2	1411	1573	1492
D_3	1440	1461	1451
D_4	911	857	884
D_5	873	826	850
Mean	1207	1204	1206

S.E. of difference of two

1. D marginal means = 99.8 lb./ac.
2. N marginal means = 27.0 lb./ac.
3. N means at the same level of D = 60.5 lb./ac.
4. D means at the same level of N = 108.6 lb./ac.

Crop :-*Sarson (Brassica Campestris)*.

Ref :-Pb. 53(15).

Site :-Oilseed Res. Stn., (M.A. farm), Faridkot.

Type :-'CI'.

Object :-To determine the optimum sowing time and irrigation requirements of *Sarson*.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) 50 lb./ac. of N in the form of A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 10 ploughings and levellings. (b) to (e) N.A. (v) No. (vi) Brown A (medium). (vii) Irrigated. (viii) Thinning and hoeing. (ix) 1.76%. (x) 2.3.1954 to 23.3.1954.

2. TREATMENTS :**Main-plot treatments :**

5 dates of sowing : $D_1=22.9.1953$, $D_2=3.10.1953$, $D_3=15.10.1953$, $D_4=27.10.1953$ and $D_5=11.11.1953$.

Sub-plot treatments :

3 levels of irrigation : $I_1=$ One irrigation, $I_2=$ Two irrigations and $I_3=$ Three irrigations.

3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/73.33 ac. (b) Main-plot=1/32 ac. Sub-plot=1/96 ac. (v) One row on each side and also buffer plots. (vi) Yes.

4. GENERAL:

(i) Good, but crop was lodged. Lodging occurred more in D_2 and D_3 sowings because of severe wind storm on 7.1.1954 when I_2 and I_3 plots of these sowings had received irrigation. (ii) No. (iii) Height, branches, pods, 100 kernel wt. and seed yield. (iv) (a) 1953—continued. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 755.3 lb./ac.
 (ii) (a) 157.03 lb./ac.
 (b) 139.76 lb./ac.
 (iii) Dates of sowing effect is highly significant. Irrigation is significant.
 (iv) Av. yield of seed in lb./ac.

	I_1	I_2	I_3	Mean
D_1	886.5	849.8	893.0	876.4
D_2	808.8	836.4	643.4	762.9
D_3	889.9	635.7	616.5	714.0
D_4	965.5	726.4	802.0	831.3
D_5	598.0	563.8	613.4	591.7
Mean	829.7	722.4	713.7	755.3

S.E. of difference of two

1. D marginal means = 64.11 lb./ac.
 2. I marginal means = 44.19 lb./ac.
 3. I means at the same level of D = 98.83 lb./ac.
 4. D means at the same level of I = 103.06 lb./ac.

Crop :- *Brassica Juncea* (Raya).

Site :- Oilseed Res. Stn., Gurgaon.

Ref :- Pb. 52(9).

Type :- 'M'.

Object :- To study the phosphate requirement of *B-juncea* with special reference to presence and absence of N.

1. BASAL CONDITIONS:

(i) (a) Nil (b) *Guara* for green manuring. (c) No. (ii) (a) Sandy loam. (b) N.A. (iii) 3.11.1952
 (iv) (a) One *hindustan* plough, 3 *desi* plough and 4 *sohaga*. (b) and (c) N.A. (d) 6' row to row. (e) N.A. (v) *Guara* green manured. (vi) *Raya* L-18. (vii) Irrigated. (viii) Nil. (ix) 2.27". (x) 16.3.1953.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N: $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac.

(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

N as A/S and P_2O_5 as Super applied on 4.1.1953.

3. DESIGN:

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 64'×8'. (v) Yes—one row each side. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Plant height, no. of branches and pods/plant, pod length, thousand grain weight and seed yield. (iv) (a) 1952—continuing. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil (vii) Nil.

5. RESULTS:

- (i) 285.8 lb./ac.
 (ii) 76.51 lb./ac.
 (iii) N effect is significant while P_2O_5 and interaction $N \times P_2O_5$ are not significant.
 (iv) Av. yield of seed in lb./ac.

	P_0	P_1	P_2	Mean
N_0	254.3	224.2	205.1	227.9
N_1	352.8	214.7	339.1	302.2
N_2	295.3	345.9	340.5	327.2
Mean	300.8	261.6	294.9	285.8

S.E. of any marginal mean = 38.26 lb./ac.
 S.E. of body of table = 22.09 lb./ac.

Crop :- *Brassica Juncea (Raya)*.

Ref :- Pb. 53(10).

Site :- Oilseed Res. Stn., Gurgaon.

Type :- 'M'.

Object :—To study the utility of P_2O_5 application to *Raya* with special reference to the presence and absence of N.

1. BASAL CONDITIONS

(i) (a) Cotton—Fallow—*Raya*. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.10.1953.
 (iv) (a) 1 *hindustan* ploughing, 3 *desi* ploughings and 4 levellings. (b) *Pore*. (c) $2\frac{1}{2}$ sr./ac. (d) N.A.
 (e) —. (v) Nil. (vi) *Raya* L-18 (medium). (vii) Irrigated. (viii) 2 thorough weedings and 2 hoeings.
 (ix) 7.28". (x) 9.3.1954.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=25$, $N_2=50$ and $N_3=75$ lb./ac. of N.

(2) 3 levels of P as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac. of P_2O_5 .

Super applied on 9.13.1953 and A/S on 5.12.1953.

3. DESIGN:

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) $5' \times 42'$. (b) $3' \times 36'-4"$. (v) 1 row on each side. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Mild attack of *alternaria*. Control measures nil. (iii) Height of plant, no. of branches, no. of pods/plant, pod length and grain weight. (iv) (a) 1952—continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

- (i) 1486 lb./ac.
 (ii) 199.9 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of *raya* in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1344	1450	1388	1394
N ₁	1542	1442	1588	1524
N ₂	1538	1558	1504	1533
N ₃	1450	1588	1438	1492
Mean	1469	1510	1480	1486

S.E. of marginal mean of N = 47.1 lb./ac.
 S.E. of marginal mean of P = 40.8 lb./ac.
 S.E. of body of table = 81.6 lb./ac.

Crop :- *Brassica Juncea (Raya)*.
 Site :- Oilseed Res. Stn., Gurgaon.

Ref :- Pb. 52(11).
 Type :- 'M'.

Object :- To study the effect of placement of fertilizers like Super and A/S on *Raya*.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Sudan grass. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 1.11.1952. (iv) (a) 4 plough (1 with *hindustan*, 3 with *desi* plough) and 4 *sohaga*. (b) N.A. (c) 2½ lb./ac. (d) and (e) N.A. (v) 10 C.L. of F.Y.M. (vi) *Raya* L.18. (vii) Irrigated. (viii) N.A. (ix) 2.27". (x) 25.3.1953.

2. TREATMENTS :

1. Control.
 2. Super at 25 lb./ac. of P₂O₅ broadcast at sowing.
 3. Super at 25 lb./ac. of P₂O₅ drilled at sowing.
 4. A/S at 25 lb./ac. of N drilled at sowing.
 5. A/S at 25 lb./ac. of N broadcast with 1st irrigation.
 6. A/S at 25 lb./ac. of N broadcast at sowing.
- Manures applied on 1.11.1952 and 4.1.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 64' × 8' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Height of 10 plants, no. of branches and pods per plant, length of pod and thousand grain weight and yield of *raya*. (iv) (a) 1952—contd. (b) and (c) Nil. (v) (a) No. (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 464.6 lb./ac.
 (ii) 118.00 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of *raya* in lb./ac.

Treatment	Av. yield
1.	488.6
2.	393.8
3.	353.7
4.	526.9
5.	521.4
6.	503.2
S.E./mean	= 48.17 lb./ac.

Crop :- *Brassica Juncia (Raya)*.
Site :- Oilseed Res. Stn., Gurgaon.

Ref :- Pb. 53(11)
Type :- 'M'.

Object :—To study the effect of placement of fertilizer like Super and A/S on yield of *Raya*.

1. BASAL CONDITIONS :

(i) (a) Cotton-Fallow-*Raya*. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 7,8.10.1953. (iv) (a) 3 ploughings (1 with *hindustan* and 2 with *desi* plough) and 3 levellings. (b) N.A. (c) 2½ sr./ac. (d) and (e) N.A. (v) Nil. (vi) *Raya* L-18 (medium). (vii) Irrigated. (viii) 2 weedings : 1 in January and 1 in February 1954, manuring on 7.10.1953, 25.11.1953 and 1.12.1953. (ix) 7.28". (x) 6.4.1954.

2. TREATMENTS :

Main-plot treatments :

5 levels of N: $N_0=0$ lb./ac., $N_1=50$ lb./ac. of N (early broadcast on 2.12.1953), $N_2=50$ lb./ac. of N (drilled on 6.10.1953), $N_3=50$ lb./ac. of N (late broadcast) and $N_4=50$ lb./ac. of N (half early and half late).

N applied as A/S.

Sub-plot treatments :

3 levels of P_2O_5 : $P_0=0$ lb./ac. of P_2O_5 , $P_1=50$ lb./ac. of P_2O_5 (by broadcast) and $P_2=50$ lb./ac. of P_2O_5 (drilled on 6.10.1953.)

P_2O_5 applied is Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 5 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot : 21'×42' sub-plot : 6'×42'. (b) 4'×36'.4". (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Mild attack of alternaria. Control measures nil. (iii) Height of plant, no. of branches per plant, no. of pods per plant, no. of grain per pod, length of pod, 100 grain weight and yield of *raya*. (iv) (a) 1952-continuing. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1846 lb./ac.
(ii) (a) 339.3 lb./ac.
(b) 219.8 lb./ac.
(iii) Only sub-plot treatments are highly significantly different.
(iv) Av. yield of *raya* in lb./ac.

	P_1	P_2	P_3	Mean
N_0	1600	1656	1763	1673
N_1	1759	1878	2003	1880
N_2	1828	1922	1981	1910
N_3	1750	1700	2113	1854
N_4	1947	1888	1903	1913
Mean	1777	1809	1953	1846

S.E. of difference of two

1. N marginal means =113.1 lb./ac.
2. P marginal means = 56.7 lb./ac.
3. P means at the same level of N =126.8 lb./ac.
4. N means at the same level of P =153.4 lb./ac.

Crop :- *Brassica Juncea* (Raya).
Site :- Barley Res. Farm, Gurgaon.

Ref :- Pb. 51(2).
Type :- 'M'.

Object :- To study the effect of N and P_2O_5 on yield of *Raya*.

1. BASAL CONDITIONS :

(i) (a) Barley-Mung-Barley or *Brassica*. (G.M). (b) *Guara* green manured. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 15.11.1951. (iv) (a) 1 *hindustan* ploughing and 4 *desi* ploughings. (b) *Pore*. (c) $2\frac{1}{2}$ sr./ac. (d) N.A. (e) —. (v) No. (vi) *Raya* L-18 (medium). (vii) Irrigated. (ix) 1.66". (x) 29.3.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=25$ and $N_2=50$ lb./ac. of N.

(2) 3 levels of P as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

Super added on 15.11.1951 ; A/S added at the time of irrigation .

3. DESIGN :

(i) R.B.D. (Fact.). (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $13' \times 66'$. (b) $11' \times 64'$. (v) 1' on each side of plot. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) No. (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 631.2 lb./ac.
(ii) 147.3 lb./ac.
(iii) N alone is highly significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean
N_0	322.2	523.8	505.2	450.4
N_1	663.0	721.3	661.7	682.0
N_2	753.2	766.4	763.8	761.1
Mean	579.5	670.5	643.6	631.2

S.E. of marginal mean of N = 34.71 lb./ac.

S.E. of marginal mean of P_2O_5 = 34.71 lb./ac.

S.E. of body of table = 60.13 lb./ac.

Crop :- *Toria* (*Brassica napus*).
Site :- Oilseed Res. Stn., M.A. Farm, Faridkot.

Ref :- Pb. 53 (14).
Type :- 'CI'

Object :- To determine the optimum sowing time and irrigational requirements of *Toria* crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Cotton. (c) 50 lb./ac. of N in the form of A/S. (ii) (a) Loam. (b) Refer soil analysis, Faridkot. (iii) As per treatments. (iv) (a) 7 ploughings before sowing and levelling. (b) to (e) N.A. (v) No. (vi) Selection A (medium). (vii) Irrigated. (viii) Thinning and hoeing. (ix) 4.49". (x) 30.12.1953. to 5.3.1954.

2. TREATMENTS :

Main-plot treatments :

5 dates of sowing : $D_1=25.8.1953$, $D_2=5.9.1953$, $D_3=15.9.1953$, $D_4=25.9.1953$ and $D_5=5.10.1953$.

Sub-plot treatments :

3 levels of irrigation : $I_1=$ One irrigation, $I_2=$ Two irrigations and $I_3=$ Three irrigations.

3. DESIGN :

- (i) Split-plot. (ii) (a) 5 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/73.33th ac. (b) main-plot : 1/32th ac. and sub-plot : 1/96th ac. (v) One row on each side and also buffer plot. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) No. (iii) Height, branches, pods, wt. of 100 kernel and yield of toria. (iv) (a) 1953—continued. (b) N.A. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 964 lb./ac.
 (ii) (a) 320.4 lb./ac.
 (b) 165.8 lb./ac.
 (iii) Effect is highly significant. Irrigation effect is significant.
 (iv) Av. yield of toria in lb./ac.

	I ₁	I ₂	I ₃	Mean
D ₁	408	617	531	519
D ₂	1027	1012	1193	1077
D ₃	1135	1315	1320	1257
D ₄	964	1131	1217	1104
D ₅	901	879	814	865
Mean	887	991	1015	964

S.E. of difference of two

1. D marginal means =130.8 lb./ac.
 2. I marginal means = 52.4 lb./ac.
 3. I means at the same level of D =117.3 lb./ac.
 4. D means at the same level of I =162.1 lb./ac.

Crop :- Linseed (*Rabi*).

Ref :- Pb. 50 (4).

Site :- Linseed Breeding Sub. Stn., Nagrota Bagwan.

Type :- 'M'.

Object :—To study the effect of graded doses of A/S on yield of Linseed.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Soyabean. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.11.1950. (iv) (a) and (b) N.A. (c) 15-18 sr./ac. (d) N.A. (e) N.A. (v) Nil. (vi) K-2 (early). (vii) Irrigated. (viii) 2 weedings. (ix) 12.17". (x) 26.4.1951.

2. TREATMENTS :

1. Control.
 2. A/S at 30 lb./ac.
 3. A/S at 40 lb./ac.
 4. A/S at 50 lb./ac.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 9'×40'. (b) 9'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 641.7 lb./ac.
 (ii) 27.68 lb./ac.
 (iii) Treatments are highly significantly different.

(iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	501.7
2.	602.8
3.	692.3
4.	770.1
S.E /mean	= 13.84 lb./ac.

Crop :- Linseed.

Ref :- Pb. 51(66).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :- To study the effect of graded doses of A/S and Super applied alone and in combination on yield of Linseed.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 23.11.1951. (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 15-18 sr./plot. (d) 9" row to row. (e) N.A. (v) Nil. (vi) K-2 (medium). (vii) Irrigated. (viii) N.A. (ix) 12.67". (x) 25.4.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac. of N.(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac. of P_2O_5 .N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (Fact.) (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6.75' x 25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 978 lb./ac.

(ii) 67.6 lb./ac.

(iii) Effects of N and P_2O_5 are highly significant their interaction is not significant.

(iv) Av. yield of linseed in lb./ac.

	P_0	P_1	P_2	Mean
N_0	664	738	871	758
N_1	971	962	1037	990
N_2	1095	1195	1269	1186
Mean	910	965	1059	978

S.E of marginal means of N or P = 19.5 lb./ac.

S.E. of body of table = 33.8 lb./ac.

Crop :- Linseed.

Ref :- Pb. 52(22).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'M'.

Object :- To find out the optimum dose of N for Linseed Crop.

1. BASAL CONDITIONS :

(i) (a) No (b) Soyabean and maize. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 30.10.1952. (iv) (a) 2 ploughings and 2 plankings. (b) Sown by *kerā*. (c) 23 sr./ac. (d) and (e) N.A. (iv) Nil. (vi) K-2 (early). (vii) Irrigated. (viii) N.A. (ix) 9.98". (x) N.A.

2. TREATMENTS :

1. Control.
 2. 40 lb./ac. of N as A/S.
 3. 60 lb./ac. of N as A/S.
 4. 80 lb./ac. of N as A/S.
- A/S applied by broadcast on 7.1.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'×36'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. Heavily lodged in plots under treatment 3 and 4. (ii) No. (iii) Yield of linseed. (iv) (a) 1950 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 881.6 lb./ac.
- (ii) 36.67 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	518.6
2.	985.3
3.	985.3
4.	1037.2
S.E./mean	=18.33 lb./ac.

Crop :-Linseed.

Ref :-Pb. 53(40).

Site :-Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :-'M'.

Object :-To find out the optimum doses of N and P_2O_5 for Linseed crop.

1. BASAL CONDITIONS :

- (i) (a) Linseed—Maize—Soyabean. (b) Soyabean and soyabean maize mixture. (c) F.Y.M. at 120 md./ac. A/S at 14.5 lb./ac. of N. (ii) (a) Loam. (b) N.A. (iii) 31.10.1953. (iv) (a) 2 ploughings and 2 *sohaga* (planking). (b) Sown by *kera*. (c) 24 [sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) K-2 (early). (vii) Irrigated. (viii) 1 hoeing and 2 weedings. (ix) 18.09". (x) 24.4.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=40$, $N_2=60$ and $N_3=80$ lb./ac. of N.

(2) 3 levels of P as Super : $P_0=0$, $P_1=40$ and $P_2=60$ lb./ac. of P_2O_5 .

3. DESIGN :

- (i) R.B.D. (Fact). (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'×12'. (v) 8 rows i.e. 4 rows along length of the field. (vi) Yes.

4. GENERAL :

- (i) Good condition, but crop was badly effected by hailstorm and the yield of seed was greatly reduced. (ii) No attack. (iii) Grain yield. (iv) (a) Continued with modifications 1950—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 269.0 lb./ac.
- (ii) 45 36 lb /ac.
- (iii) Effects of N and P_2O_5 and their interactions are significant.

(iv) Av. yield of linseed in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	194.5	272.2	272.2	246.3
N ₁	505.6	311.1	233.4	350.0
N ₂	291.7	330.6	252.8	291.7
N ₃	194.5	175.0	194.5	188.0
Mean	296.6	272.2	238.2	269.0

S.E. of marginal mean of N =13.09 lb./ac.

S.E. of marginal mean of P₂O₅ =11.34 lb./ac.

S.E. of body of table =22.68 lb./ac.

Crop :-Linseed.

Ref :-Pb. 51(65).

Site :-Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :-'M'.

Object :—To study the effect of graded doses of A/S on yield of Linseed crop.

1. BASAL CONDITIONS :

- (i) (a) Linseed-Maize Soyabean. (b) Soyabean. (c) Nil. (ii) Loam. (b) N.A. (iii) 30.10.1951.
 (iv) (a) Ploughing and *sohaga*. (b) N.A. (c) 15-18 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil.
 (vi) K-2 (medium). (vii) Irrigated. (viii) N.A. (ix) 12.67". (x) 24.4.1952.

2. TREATMENTS :

- Control.
 - A/S at 40 lb./ac. of N.
 - A/S at 60 lb./ac. of N.
 - A/S at 80 lb./ac. of N.
- Manured on 11.2.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×6'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) and (ii) N.A. (iii) Yield of linseed. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 816.8 lb./ac.
 (ii) 49.65 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	570.4
2.	855.7
3.	959.4
4.	881.6
S.E./mean	=20.27 lb./ac.

Crop :- Linseed.

Ref :- Pb. 53 (23).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan. Type :- 'C'.

Object :- To study the effect of preceding crop on yield of Linseed crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rice. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 27.9.1952 and 1.11.1952. (iv) (a) and (b) Treatment 1—sowing by broadcast with one ploughing, treatment 2—2 ploughings. (c) 24 sr./ac. (d) and (e) N.A. (v) Nil. (vi) K-2 (early). (vii) Irrigated. (viii) N.A. (ix) 9.98". (x) N.A.

2. TREATMENTS :

1. Sowing in standing rice on 27.9.1952.
2. Sowing in harvested rice field on 1.11.1952.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 1/220th ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) No. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 777.9 lb./ac.
- (ii) 64.50 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	707.1
2.	848.6
S.E./mean	= 26.33 lb./ac.

Crop :- Linseed (*Rabi*).

Ref :- Pb. 50 (5).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'C'.

Object :- To study the effect of preceding crops on yield of Linseed crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize and rice. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.11.1950. (iv) (a) and (b) N.A. (c) 15-18 sr./ac. (d) and (e) N.A. (vi) K-2 (early). (vii) Irrigated. (viii) Weeding. (ix) 12.17". (x) 24.4.1951.

2. TREATMENTS :

- 2-previous crops :-
1. Maize.
 2. Rice.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 18'×6'. (b) 18'×6'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 544.5 lb./ac.
- (ii) 65.59 lb./ac.
- (iii) Treatments are highly significantly different.

(iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	648.2
2.	440.8
S.E./mean	= 26.78 lb./ac.

Crop :- Linseed.

Ref :- Pb. 51(64).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'C'.

Object :- To study the effect of previous crops on yield of Linseed.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rice and maize. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 29.9.1951 for treatment 2 and 29.10.1951 for other treatments. (iv) (a) 4 ploughings and 5 *sohaga*. (b) N.A. (c) 15-18 sr./ac. (d) 9" row to row. (v) Nil. (vi) K-2 (medium). (vii) Irrigated. (viii) One weeding. (ix) 12.67". (x) 21.4.1952.

2. TREATMENTS :

1. Sowing after rice.
2. Seed broadcast in standing rice.
3. Sowing done after maize crop is removed.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9' x 18'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) to (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 403.3 lb./ac.
- (ii) 23.02 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	414.9
2.	311.8
3.	484.0
S.E./mean	= 11.51 lb./ac.

Crop :- Linseed (*Rabi*).

Ref :- Pb. 50(3).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'C'.

Object :- To study the effect of different seedrates on yield of Linseed.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) Loam. (b) N.A. (iii) 22.11.1950. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) K-2 (early). (vii) Irrigated. (viii) One weeding. (ix) 12.17". (x) 25.4.1951.

2. TREATMENTS

- 3 seed rates :
1. 15 sr./ac.
 2. 18 sr./ac.
 3. 21 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) $24' \times 7\frac{1}{2}'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1950—53. (b) and (c) No. (v) (a) and (o) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 570.4 lb./ac.
 (ii) 61.36 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	435.6
2.	528.9
3.	746.7
S.E./mean	= 30.68 lb./ac.

Crop :- Linseed.

Ref :- Pb. 51(63).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'C'.

Object :—To study the effect of different seedrates on yield of Linseed.

1. BASAL CONDITIONS :

(i) (a) Linseed-Maize and Soya bean. (b) Maize. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 29.10.1951.
 (iv) (a) 4 ploughings and 4 *sohaga*. (b) N.A. (c) As under treatments. (d) 9' row to row. (e) N.A.
 (v) Nil. (vi) K-2 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 12.67". (x) 24.4.1952.

2. TREATMENTS :

- 4 seed rates :
 1. 15 sr./ac.
 2. 18 sr./ac.
 3. 21 sr./ac.
 4. 24 sr./ac.

3. DESIGN

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) $6' \times 60'$. (b) $6' \times 45'$. (v) $7\frac{1}{2}'$ left out as non-exptl. area on two sides of each plot. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield of linseed (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 596.4 lb./ac.
 (ii) 29.74 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	518.6
2.	601.5
3.	689.7
4.	575.6
S.E./mean	= 14.87 lb./ac.

Crop :- Linseed.

Ref :- Pb. 52(21).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'C'.

Object :- To find out suitable seedrate for K-2 variety of Linseed.

1. BASAL CONDITIONS :

(i) (a) No. (b) Soyabean and maize mixture. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 28.10.1952. (iv) (a) 2 ploughings and 2 plankings. (b) Sown with small hand plough. (c) 24 sr./ac. (d) 9" row to row. (e) N.A. (v) N.A. (vi) K-2 (early). (vii) Irrigated. (viii) Nil. (ix) 9.98". (x) N.A.

2. TREATMENTS :

Seedrate.

1. 15 sr./ac.
2. 18 sr./ac.
3. 21 sr./ac.
4. 24 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/121 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Yield/plot. (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 478.4 lb./ac.
 (ii) 18.70 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	311.1
2.	373.4
3.	482.3
4.	746.7
S.E./mean	= 9.35 lb./ac.

Crop :- Linseed.

Ref :- Pb. 53 (41).

Site :- Linseed Breeding Sub. Stn., Nagrota Bagwan.

Type :- 'C'.

Object :- To find out optimum seedrate for K-2 variety of Linseed.

1. BASAL CONDITIONS :

(i) (a) Linseed-Maize and Soyabean. (b) Soyabean and maize mixture. (c) F.Y.M. at 133 md./ac. and A/S at 24 lb./ac. (iii) 29.10.1953. (iv) (a) 2 ploughings, 2 *sohaga* (planking). (b) Sown with small hand plough by beam. (c) As per treatments. (d) row to row distance 9". (e)—. (v) F.Y.M. at 83 md./ac. on 16.10.1955 broadcast. A/S at 40 lb./ac. of N on 29.11.1953 broadcast. (vi) K-2 early maturing. (vii) Irrigated. (viii) 2 weedings, 1 hoeing. (ix) 18.09". (x) 23.4.1954.

2. TREATMENTS :

Seedrate :

1. 18 sr./ac.
2. 21 sr./ac.
3. 24 sr./ac.
4. 27 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 9'×18'. (v) 8 rows. (vi) Yes.

4. GENERAL :

- (i) Medium. (ii) No. (iii) Yield only (iv) (a) 1950—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Seedrates tried this year were not exactly the same as in the previous year.

5. RESULTS :

- (i) 442.1 lb./ac.
 (ii) 29.54 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of linseed in lb./ac.

Treatment	Av. yield
1.	386.0
2.	449.4
3.	484.0
4.	368.8
S.E./mean	= 12.36 lb./ac.

Crop :- Linseed (*Rabi*).

Ref :- Pb. 49(3).

Site :- Distt. and Demonstration Farm, Kangra.

Type :- 'CV'.

Object :- To find the optimum seedrate for different varieties.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.10.1949. (iv) (a) 5 ploughings, 4 *sohaga*. (b) N.A. (c) As per treatments. (d) N.A. (e) N.A. (v) 50 lb./ac. of F.Y.M. on 19.9.1949. (vi) As under treatments. (vii) Irrigated. (viii) 1 weeding. (ix) 15.23". (x) 27.4.1950.

2. TREATMENTS :

Main-plot treatments :

2 varieties : $V_1=K-2$ and $V_2=No. 37$.

Sub-plot treatments :

4 seedrates : $S_1=6$ sr./ac., $S_2=9$ sr./ac., $S_3=12$ sr./ac. and $S_4=15$ sr./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) Sub-plot 48.4' x 3'. (v) No. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 787.1 lb./ac.
 (ii) (a) 370.36 lb./ac.
 (b) 237.52 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of linseed in lb./ac.

	S_1	S_2	S_3	S_4	Mean
V_1	588.2	616.1	829.3	954.6	754.6
V_2	713.6	771.4	1022.1	771.4	819.6
Mean	650.9	708.8	925.7	863.0	717.1

S.E. of difference of two

1. V marginal means = 130.92 lb./ac.
 2. S marginal means = 118.75 lb./ac.
 3. S means at a level of V = 167.95 lb./ac.
 4. V means at a level of S = 195.71 lb./ac.

Crop :- Berseem.

Ref :- Pb. 53(76).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the effect of application of N and P_2O_5 in the form of A/S and Super respectively alone and in combination on the yield of Berseem crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) *Chari* (fodder). (c) 10 C.L. of F.Y.M on 15.6.1953 and 16.6.1953 by broadcast. (ii) (a) Heavy loam. (b) N.A. (iii) 25.10.1953. (iv) (a) 4 ploughings, and 4 *sohaga*. (b) N.A. (c) 8 sr./ac. (d) and (e) N.A (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 10.42". (x) 3 cuttings on 24.12.1953, 1.3.1954 and 25.4.1954.

2. TREATMENTS

All combinations of (1) and 2).

(1) 3 levels of N as A/S : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=50$ and $P_2=100$ lb./ac.

P_2O_5 applied on 25.10.1953 and A/S on 16.11.1953 by broadcast.

3. DESIGN

(i) R.B.D. (Fact.). (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) $9' \times 76' - 4''$. (v) Nil. (vi) Yes.

4. GENERAL

(i) Normal. No lodging. (ii) Nil. (iii) Green fodder yield only. (iv) (a) 1953 to 1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.36 ton/ac.
(ii) 1.21 ton/ac.
(iii) N and P_2O_5 effects are highly significant.
(iv) Av. yield of fodder in ton/ac.

	N_0	N_1	N_2	Mean.
P_0	15.49	17.29	18.40	17.06
P_1	19.04	19.26	21.04	19.78
P_2	19.91	21.51	22.33	21.25
Mean	18.15	19.35	20.59	19.36

S.E. of any marginal mean = 0.35 ton/ac.

S.E. of body of the table = 0.60 ton/ac.

Crop :- Berseem.

Ref :- Pb. 48(21).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To find a suitable manure for Berseem fodder crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) Maize for fodder. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 21.10.1943. (iv) (a) 1 *raja*, 4 *desi* plough. (b) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated (viii) Nil. (ix) 7.30". (x) 10.12.1948, 1.2.1949, 21.3.1949, 20.4 1949 and 26.5.1949.

2. TREATMENTS :

1. A/S at 75 lb./ac. of N.
2. A/N at 75 lb./ac. of N.
3. Ammo. Phos. at 75 lb./ac. of N.
4. Super at 94.5 lb./ac. of P_2O_5 .
5. Control.

Manures applied on 15.12.1948.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 12'×52'. (b) 12'×45'—4½". (v) N.A. (vi) Yes.

4. GENERAL :

- (i) No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 26.74 ton/ac.
 (ii) 1.43 ton/ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	27.90
2.	27.27
3.	29.01
4.	26.80
5.	22.70
S.E./mean	≅0.64 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- Pb. 49 (25).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :—To study the effect of Super on grain yield of Berseem.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 13.10.1949.
 (iv) (a) 1 *raja* ploughing, 3 *desi* ploughing and 5 *sohaga*. (b) N.A. (c) 16 sr./ac. (d) and (e) N.A.
 (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 6.14". (x) 8.6.1950.

2. TREATMENTS :

1. 1 md./ac. of Super
 2. 2 md./ac. of Super
 3. Control.
- Super applied on 31.12.1949.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/32 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Germination and growth satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —.
 (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 474.0 lb./ac.
 (ii) 81.39 lb./ac.
 (iii) Treatments are not significantly different.

(iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	440.9
2.	469.0
3.	512.2
S.E./mean	= 33.23 lb./ac.

Crop :- Berseem.

Ref :- Pb. 53 (97).

Site :- Jullundur Agri. Sta., Jullundur.

Type :- 'M'.

Object :—To study the effect of N and P₂O₅ on yield of Berseem fodder.

1. BASAL CONDITIONS :

(i) (a) No. (b) Tobacco. (c) A/S at 30 lb./ac. of N. (ii) (a) Loamy. (b) Refer soil analysis, Jullundur. (iii) 22.11.1953. (iv) (a) 7 *desi hal*; 5 *sohaga*. (b) N.A. (c) 7 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 10.33". (x) 3 cuttings : 4-10.2.1954, 16to 22.4.1954, 25.5.1954 to 7.6.1954.

2. TREATMENTS :

- Control (uninoculated seed).
 - Inoculated berseem seed.
 - 100 lb./ac. of P₂O₅ as Super.
 - 200 lb./ac. of P₂O₅ as Super.
 - 50 lb./ac. of N as A/S.
 - 100 lb./ac. of N as A/S.
 - 100 lb./ac. of P₂O₅ as Super+50 lb./ac. of N as A/S.
 - 100 lb./ac. of P₂O₅ as Super+100 lb./ac. of N as A/S.
 - 200 lb./ac. of P₂O₅ as Super+50 lb./ac. of N as A/S.
 - 200 lb./ac. of P₂O₅ as Super+100 lb./ac. of N as A/S.
- Super drilled one day before sowing and A/S by broadcast at sowing time.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) 4. (iii) N.A. (iv) (a) and (b) 51.25'×8.5', (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1953 to 1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 18.19 ton/ac.
(ii) 1.36 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	16.51
2.	16.92
3.	18.55
4.	18.78
5.	18.92
6.	18.69
7.	18.14
8.	17.33
9.	18.78
10.	19.24
S.E./mean	= 0.68 ton/ac.

Crop :- Berseem.

Ref :- Pb. 53(92).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'M'.

Object :- To study the relative effect of inoculation of Berseem seed and application of Nitrogen.

1. BASAL CONDITIONS :

(i) (a) Not followed. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Jullundur. (iii) 3.9.1953. (iv) (a) 1 *raja* plough, 3 *desi* plough and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 10.33". (x) [21.11.1953 to 24.11.1954.

2. TREATMENTS :

1. Inoculated seed.
2. Re-inoculated seed.
3. 20 lb./ac. of N as A/S ($\frac{1}{2}$ drilled before sowing and $\frac{1}{2}$ to be given after 1st cutting).
4. 10 lb./ac. of N as A/S + 20 lb./ac. of P_2O_5 drilled as Super before sowing + 10 lb./ac. of N as A/S after 1st cutting applied on 17.12.1953 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 98' x 9.26'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Fodder yield/plot. (iv) (a) 1953-55. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 30.55 ton/ac.
 (ii) 1.07 ton/ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	38.25
2.	37.77
3.	38.24
4.	38.49
S.E./mean	= 0.54 ton/ac.

Crop :- Berseem.

Ref :- Pb. 51(58).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :- To study the effect of different manures on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 16.10.1951. (iv) (a) 5 ploughings and 4 *sahaga*. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 3.56". (x) 21.12.1952, 30.1.1952 to 1.2.1952, 27.2.1952, 29.2.1952 and 8.9.4.1952.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N.
 2. Ammo. Phos. at 100 lb./ac. of N.
 3. Super at 125 lb./ac. of P_2O_5 .
 4. Control.
- A/S and Super applied on 1.1.1952 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12' x 80'. (b) 10' x 80'. (v) 2' from plot to plot left out. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951-52. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 32.17 ton/ac.
 (ii) 2.17 ton/ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	31.82
2.	34.55
3.	33.88
4.	28.44
S.E./mean	= 0.88 ton/ac.

Crop :-Berseem.

Ref :-Pb. 52(131).

Site :-Agri. Stn. Karnal.

Type :-'M'.

Object :—To study the effect of different manures on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 23.9.1952. (iv) (a) 5 ploughings and 4 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 3.20'. (x) 6-8.11.1952 and 13-14.12.1952.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N.
 2. Ammo. phos. at 100 lb./ac. of N.
 3. Super at 125 lb./ac. of P₂O₅.
 4. Control.
 Super applied on 23.9.1952 before sowing. For A/S and Ammo. phos. dates N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 10'×80'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951—1952. (b) Nil. (c) —. (v) (a) Nil. (b) —. (vi) Nil. (vii) Yield for only two cuttings is available. The subsequent cuttings were auctioned without recording the weight.

5. RESULTS :

(i) 7.27 ton/ac.
 (ii) 0.72 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	6.99
2.	7.77
3.	7.42
4.	6.91
S.E./mean	=0.29 ton/ac.

Crop :- Berseem (*Rabi*)
Site :- Agri. Stn. Karnal.

Ref :- Pb. 52(132).
Type :- 'M'.

Object :- To study the effect of different manures on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize for fodder. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 23.9.1952. (iv) (a) 5 ploughings and 5 *sohaga*. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 3.20". (x) 2-4.11.1952 and 7.12.1952.

TREATMENTS :

1. A/S at 100 lb./ac. of N.
 2. Ammo. phos. at 100 lb./ac. of N.
 3. Super at 125 lb./ac. of P₂O₅.
 4. Control.
- Time and method of application of treatments-N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 10' × 80'. (v) Nil. (vii) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951—1952. (b) Nil. (c) N.A. (v) (a) Nil. (b) —. (vi) Nil. (vii) Yield record available only for 2 cutting. After taking 2 cuttings, subsequent yield was not recorded by the Research Station because standing fodder was sold by auction on 10.2.1953.

5. RESULTS :

- (i) 7.32 ton/ac.
- (ii) 1.09 ton/ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	7.90
2.	8.03
3.	7.20
4.	6.16
S.E./mean	=0.445 ton/ac.

Crop :- Berseem.
Site :- Agri. Stn., Karnal.

Ref :- Pb. 48(34).
Type :- 'M'.

Object :- To study the effect of A/S, Super and Ammo. Phos. on Berseem yield

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26.10.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2.90". (x) 23.12.1949, 2.2.1949.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N.
 2. Ammo. Phos. at 100 lb./ac. of N+125 lb./ac. of P₂O₅.
 3. Super at 125 lb./ac. of P₂O₅.
 4. Control.
- A/S and Super applied on 26.10.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) N.A. (b) 11' × 80'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948—1950. (b) No. (c) N.A. (v) (a) No. (b)—. (vi) Nil. (vii) Yield of only two cuttings is available, information about further cuts if any is not available.

5. RESULTS:

(i) 8.17 ton/ac.
 (ii) 1.25 ton/ac.
 (iii) Treatments are highly significantly different.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	7.55
2.	11.13
3.	8.38
4.	5.63
S.E./mean	=0.36 ton/ac.

Crop :- Berseem.

Ref :- Pb. 49(68).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :- To study the effect of A/S, Super and Ammo. Phos. on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 8.12.1949. (iv) (a) to (c) N.A. (v) Nil. (vi) Mascavi (vii) Irrigated. (viii) Nil. (ix) 4.13". (x) 2.2.1950, 15.3.1950 and 28.4.1950.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N.
2. Ammo. Phos. at 100 lb./ac. of N+125 lb./ac. of P_2O_5 .
3. Super at 125 lb./ac. of P_2O_5 .
4. Control.

Super applied before sowing on 8.12.1949 and A/S, Ammo. Phos. $\frac{1}{2}$ at sowing and $\frac{1}{2}$ at 1st irrigation on 25.12.1949.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 80' x 11'. (v) No. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b)—. (c) No. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 20.47 ton/ac.
 (ii) 1.70 ton/ac.
 (iii) Treatments are highly significantly different.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	18.21
2.	24.96
3.	21.96
4.	16.74
S.E./mean	= 0.69 ton/ac.

Crop :- Berseem.

Ref :- Pb. 50(76).

Site :- Agri. Stn., Karnal.

Type :- 'M'.

Object :—To study the effect of A/S, Ammo. Phos and Super on the yield of Berseem fodder.

1. BASAL CONDITIONS

(i) (a) Wheat-Berseem-Wheat-Berseem. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 31.10.1950. (iv) (a) to (e) N.A. (v) N.A. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2'23". (x) 1.2.1951, 24.3.1951, 4.5.1951.

2. TREATMENTS :

1. A/S at 100 lb./ac. of N.
2. Ammo. Phos. at 100 lb./ac. of N+125 lb./ac. of P_2O_5 .
3. Super at 125 lb./ac. of P_2O_5 .
4. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) (a) 12'×80'. (b) 12'×80'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) forage yield/plot. (iv) (a) 1948—1950. (b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.25 ton/ac.
- (ii) 11.32 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	15.75
2.	20.41
3.	18.84
4.	14.02
S.E./mean	= 3.27 ton/ac.

Crop :- Berseem.

Ref :- Pb. 50(71).

Site :- Agri. Stn. Karnal.

Type :- 'M'.

Object :—To find the effect of A/S and Super on the yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 16.11.1950. (iv) (a) 6 ploughings and 6 rollers. (b) N.A. (c) 3 chh./plot. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2.23". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 3 levels of N: $N_0=0$, $N_1=50$, $N_2=100$ lb./ac.
 - (2) 4 levels of P_2O_5 : $P_0=0$, $P_1=62.5$, $P_2=93.75$, $P_3=125$ lb./ac.
- Source of N is A/S and of P_2O_5 as Super.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 8'×75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 20.18 ton/ac.
(ii) 2.11 ton/ac.
(iii) Effect of P and interaction NP are highly significant. Effect of N is not significant.
(iv) Av. yield of fodder in ton/ac.

	P ₀	P ₁	P ₂	P ₃	Mean
N ₀	13.19	18.09	24.29	23.36	19.73
N ₁	17.98	14.95	23.66	25.85	20.61
N ₂	19.54	22.29	16.68	22.24	20.19
Mean	16.90	18.44	21.54	23.82	21.18

S.E. of marginal mean of N = 0.53 ton/ac.
S.E. of marginal mean of P = 0.61 ton/ac.
S.E. of body of table = 1.05 ton/ac.

Crop :- Berseem.

Ref :- Pb. 53(113).

Site :- Chemical Section, B.A. Farm, Rauni.

Type :- 'M'.

Object :- To study the effect of different doses of Super on Berseem crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize (for fodder). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 13.10.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 7.50". (x) 3.12.1953, 26.1.1954, 1.3.1954, 16.4.1954 and 25.5.1954.

2. TREATMENTS :

- Control.
 - 200 lb./ac. of Super.
 - 400 lb./ac. of Super.
 - 600 lb./ac. of Super.
- Super drilled 3" deep on 12.10.1953.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 80.7' x 18'. (b) 68' x 16'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 27.28 ton/ac.
(ii) 3.85 ton/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	19.44
2.	27.97
3.	32.19
4.	29.54
S.E./mean	= 1.93 ton/ac.

Crop :- Berseem.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 48(62).
Type :- 'M'.

Object :—To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 18.10.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.26". (x) 2nd cutting on 20.3.1949 and 3rd cutting on 24.5.1949.

2. TREATMENTS

1. Control.
2. Ammo. Phos. at 40 lb./ac. of N applied on 31.3.1949.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) For four replications 0.08 ac. and for other four 0.10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Fodder yield for two cuttings only. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil (vii) Yield data available only for 2nd and 3rd cutting.

5. RESULTS :

- (i) 4.510 ton/ac.
- (ii) 0.776 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	4.382
2.	4.637
S.E./mean	= 0.275 ton/ac.

Crop :- Berseem.
Site :- Agri. Farm, Rohtak.

Ref :- Pb. 49(89).
Type :- 'M'.

Object :—To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 27.10.1949. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2.15". (x) 1.1.1950 to 12.1.1950, 1.2.1950 to 13.2.1950, 1.3.1950 to 9.3.1950, 13.4.1950 to 18.4.1950.

2. TREATMENTS :

1. Control.
2. Ammo. Phos. at 40 lb./ac. of N.
 Ammo. Phos. applied on 17.12.1949.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1948 to 1950. (b) No. (c) Nil. (v) (a) No (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 22.72 ton/ac.
- (ii) 2.05 ton/ac.
- (iii) Treatments are not significantly different.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	21.31
2.	24.13
S.E./mean	= 0.92 ton/ac.

Crop :- Berseem.

Site :- Agri. Farm, Rohtak.

Ref :- Pb. 50(98).

Type :- 'M'.

Object :- To study the effect of Ammo. Phos. on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 5.10.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 1.83". (x) 27.1.1951, 22.2.1951, 17.3.1951, 8,12.4.1951 and 7,8.6.1951.

2. TREATMENTS :

1. Control.
2. Ammo. Phos. at 40 lb./ac. of N.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948 to 1950. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.556 ton/ac.
- (ii) 1.510 ton/ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	14.808
2.	24.573
S.E /mean	= 0.676 ton./ac.

Crop :- Berseem.

Site :- Agri. Farm (Soil Sub-Stn.), Rohtak.

Ref :- Pb. 53(159).

Type :- 'M'.

Object :- To find the suitable manurial formula for Berseem fodder crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 18.10.1953. (iv) (a) 4 ploughings and 3 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 8.10". (x) 9.12.1953, 31.12.1953, 21.1.1954, 11.2.1954, 21.2.1954, 26.3.1954, 1.4.1954, 26.4.1954 and 17.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.

(2) 3 levels of P_2O_5 : $P_0=0$, $P_1=100$ and $P_2=200$ lb./ac.

Source of N is A/S and of P_2O_5 is Super.

3. DESIGN :

(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) and (b) No. (c) — (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 25.02 ton/ac.
 (ii) 1.59 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of fodder in ton/ac.

	N ₀	N ₁	N ₂	Mean
P ₀	24.37	24.61	24.14	24.37
P ₁	23.70	26.03	25.43	25.05
P ₂	25.31	25.76	25.79	25.62
Mean	24.46	25.47	25.12	25.02

S.E. of any marginal mean = 0.46 ton/ac.
 S.E. of body of table = 0.80 ton/ac.

Crop :- Berseem.

Ref :- Pb. 51(53).

Site :- Agri. Farm (Soil Sub-Stn.), Rohtak.

Type :- 'M'.

Object :—To study the manurial requirements of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 21.10.1951. (iv) (a) 3 *desi hal.* (b) to (e) N.A. (v) Nil. (vi) *Mascavi*. (vii) Irrigated. (viii) Nil. (ix) 3.02". (x) 26.12.1951, 21.1.1952, 8.2.1952, 11.2.1952, 10.3.1952, 8.4.1952 and 8.5.1952.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac. of N.
 (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=60 lb./ac. of P₂O₅.

3. DESIGN :

(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 31'-8"×63'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Green forage yield. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 31.77 ton/ac.
 (ii) 1.45 ton/ac.
 (iii) Treatments are highly significantly different. P₂O₅ effect is highly significant.
 (iv) Av. yield of fodder in ton/ac.

	N ₀	N ₁	Mean
P ₀	29.33	31.20	30.27
P ₁	33.67	32.88	33.28
Mean	31.50	32.04	31.77

S.E. of any marginal mean = 0.46 ton/ac.
 S.E. of body of table = 0.65 ton/ac.

Crop :- Berseem
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 48 (45).
Type :- 'M'.

Object :—To find out a suitable dose of A/S for Berseem crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 6.10.1948. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.90". (x) N.A.

2. TREATMENTS :

1. Control.
 2. A/S at 100 lb./ac. of N.
 3. A/S at 150 lb./ac. of N.
- A/S applied after taking 1st cut.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/20 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1947—1948. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Six cuts were taken.

5. RESULTS :

- () 11.48 ton/ac.
(ii) 1.03 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	11.34
2.	11.41
3.	11.70
S.E./mean	= 0.42 ton/ac.

Crop :- Berseem (*Rabi*).
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 50(32).
Type :- 'M'.

Object :—To find the response of Berseem to the application of F.Y.M., A/S and Super.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 5.10.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.91". (x) 1st. cut on 15-26.12.1950, 2nd on 31.1.1951, 3rd on 11.3.1951, 4th on 18.4.1951 and 5th cut on 9.5.1951.

2. TREATMENTS :

1. Control.
2. A/S at 60 lb./ac. of N.
3. Super at 30 lb./ac. of P_2O_5 .
4. A/S at 60 lb./ac. of N+Super at 30 lb./ac. of P_2O_5 .
5. F.Y.M. at 375 md./ac.
6. F.Y.M. at 750 md./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 88'×8.25' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) Nil. (vi) Nil. (vii) Yield of treatment 6 in 6th replication was not available and has been estimated by missing plot technique.

5. RESULTS :

- (i) 32.19 ton/ac.
 (ii) 3.001 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	30.68
2.	31.73
3.	33.89
4.	31.85
5.	31.59
6.	33.42

S.E. mean (other than treatment 6) = 1.225 ton/ac.
 S.E. difference of two means when one mean is missing = 1.833 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- Pb. 51 (100).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :- To study the response of Berseem to the application of F.Y.M., A/S and Super.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 30.9.1951. (iv) (a) 1 *raja*, 3 *desi* plough and 4 *sohaga*. (b) N.A. (c) 4 chs/plot. (d) and (e) N.A. (v) Nil. (vi) *Mascavi*. (vii) Irrigated. (viii) Nil. (ix) 1.94%. (x) 1st cut—20 to 27.11.1951, 2nd cut—29.12.1951 to 6.1.1952, 3rd cut—6 to 19.2.1952, 4th cut—18 to 27.3.1952, 5th cut—5 to 18.4.1952 and 6th cut—29.4.1952 to 1.5.1952.

2. TREATMENTS:

- Control.
 - A/S at 60 lb./ac. of N.
 - Super at 30 lb./ac. of P_2O_5 .
 - A/S at 60 lb./ac. of N+Super at 30 lb./ac. of P_2O_5 .
 - F.Y.M. at 375 md./ac.
 - F.Y.M. at 750 md./ac.
- A/S and Super applied on 26.9.1951 and F.Y.M. applied on 25, 26.9.1951.

3. DESIGN :

- (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 8.25' x 132'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS

- (i) 29.41 lb./ac.
 (ii) 2.41 lb./ac.
 (iii) Treatment differences are highly significant-
 (iv) Av. yield of forage in ton./ac.

Treatment	Av. yield
1.	28.09
2.	25.88
3.	27.75
4.	30.57
5	32.12
6.	32.03
S.E./mean	= 1.08 ton/ac.

Crop :- Berseem.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 52 (30).
Type :- 'M'.

Object :—To study the response of Berseem crop to the application of F.Y.M., A/S and Super.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 27.9.1952. (iv) (a) 2 *raja* plough and 1 *desi* plough. (b) Broadcast. (c) 8 sr./ac. (d) and (e)—. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) 2 hoeings and 1 weeding. (ix) 7.36". (x) 1st cut—15.12.1952 to 21.12.1952, 2nd cut—5.2.1953 to 17.2.1953, 3rd cut—N.A. and 4th cut—10.4.1953 to 17.4.1953.

2. TREATMENTS :

1. Control.
 2. 60 lb./ac. of N as A/S.
 3. 30 lb./ac. of P_2O_5 as Super.
 4. 60 lb./ac. of N as A/S+30 lb./ac. of P_2O_5 as Super.
 5. F.Y.M. at 375 md./ac.
 6. F.Y.M. at 750 md./ac.
- F.Y.M. applied on 25.9.1952 by broadcast. A/S and Super applied on 26.9.1952 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 13'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Below normal due to inadequate irrigation. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) Nil. (vii) Due to restricted supply of water during *rabi* season, crop was not able to utilize manure to the full extent. The crop suffered and began to show signs of dryness very early.

5. RESULTS :

- (i) 24.15 ton/ac.
- (ii) 2.65 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of forage in ton./ac.

Treatment	Av. yield
1.	24.03
2.	24.05
3.	24.88
4.	22.49
5.	22.70
6.	26.77
S.E./mean	= 1.08 ton/ac.

Crop :- Berseem.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 52(32).
Type :- 'M'.

Object : - To study and find out the suitable combination of N and Super on the fodder yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam. (b) Refer soil analysis, Sirsa. (iii) 26.9.1952. (iv) (a) 2 *desi* plough and 1 *sohaga*. (b) broadcast. (c) 8 sr./ac. (d) and (e)—. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 7.36". (x) 1st cut—6.12.1952 to 10.12.1952, 2nd cut 24.1.1953 and 26.1.1953, 3rd cut—1.3.1953 to 20.3.1953 and 4th cut—5.4.1953 to 18.4.1953.

2. TREATMENTS :

- All combinations of (1) and (2)
- (1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac.
 - (2) 4 levels of P_2O_5 : $P_0=0$, $P_1=50$, $P_2=100$ and $P_3=150$ lb./ac.
- N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 8.5'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Forage yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) No. (b)—. (v.) and (vii) Nil.

5. RESULTS :

- (i) 14.53 ton/ac.
 (ii) 2.06 ton/ac.
 (iii) N effect is highly significant while others are not significant.
 (iv) Av. yield of fodder in ton/ac.

	P ₀	P ₁	P ₂	P ₃	Mean
N ₀	13.46	13.84	12.74	13.27	13.33
N ₁	14.01	14.78	14.08	13.73	14.15
N ₂	14.71	16.82	17.00	15.88	16.10
Mean	14.06	15.15	14.61	14.29	14.53

S.E. of marginal mean of N = 0.52 ton/ac.
 S.E. of marginal mean of P = 0.59 ton/ac.
 S.E. of body of table = 1.03 ton/ac.

Crop :- Berseem.

Ref :- Pb. 53(54).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :—To study the response of Berseem to varying proportions of N and P₂O₅ applied alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy-light (medium). (b) Refer soil analysis, Sirsa. (iii) 23.9.1953. (iv) (a) 4 *desi* plough, 1 *panjdenta* (Horse hoe) 2 *sohaga* (planking). (b) N.A. (c) 2½ chh./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi (vii) Irrigated. (viii) Nil. (ix) 10.26". (x) 1st cut— 18.11.1953 to 23.11.1953, 2nd cut—24.12.1954 to 1.1.1954, 3rd cut—5.2.1954 to 17.2.1954, 4th cut—23.3.1954 to 3.4.1954 and 5th cut - 20.4.1954 to 22.4.1954.

2. TREATMENTS :

- | | |
|---|---|
| 1. Control. | 7. 200 lb./ac. of P ₂ O ₅ . |
| 2. 50 lb./ac. of N. | 8. 50 lb./ac. of N+50 lb./ac. of P ₂ O ₅ . |
| 3. 100 lb./ac. of N. | 9. 100 lb./ac. of N+50 lb./ac. of P ₂ O ₅ . |
| 4. 50 lb./ac. of P ₂ O ₅ . | 10. 100 lb./ac. of N+100 lb./ac. of P ₂ O ₅ . |
| 5. 100 lb./ac. of P ₂ O ₅ . | 11. 100 lb./ac. of N+150 lb./ac. of P ₂ O ₅ . |
| 6. 150 lb./ac. of P ₂ O ₅ . | 12. 100 lb./ac. of N+200 lb./ac. of P ₂ O ₅ . |
- N as A/S and P₂O₅ as Super applied at the time of sowing by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 7'×62'. (b) 7'×58'. (v) 4' on *khal* side (irrigation channel side). (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Green forage yield. (iv) a 1952—1955. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 52.158 ton/ac.
 (ii) 2.603 ton/ac.
 (iii) Treatment differences are highly significant.

(iv) Av. yield of fodder in ton./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	47.366	7.	53.913
2.	48.461	8.	52.221
3.	48.757	9.	51.204
4.	50.629	10.	54.980
5.	53.322	11.	55.654
6.	54.488	12.	54.899

S.E./mean = 1.062 ton/ac.

Crop :- Berseem.

Ref :- Pb. 53(56).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :—To study the effect of application of fertilizers on seed setting of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 28.9.1953. (iv) (a) 3 ploughs, 2 plankings and 1 horse hoe. (b) N.A. (c) Approximately 14 seer./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) 2 weedings. (ix) 10.26". (x) 1st cut 30.11.1953, 2nd cut—27.1.1954 to 29.1.1954, 3rd cut—8.3.1954 to 9.3.1954 and 4th cut—date not available.

2. TREATMENTS :

- No manure.
- 100 lb./ac. of N+200 lb./ac. of P_2O_5 applied at the time of sowing.
- 100 lb./ac. of N+200 lb./ac. of P_2O_5 applied at sowing and after each cutting in equal quantities by ground application on 28.9.1953, 3.12.1953, 31.1.1954 and 18.3.1954.
- 100 lb./ac. of N+200 lb./ac. of P_2O_5 applied by spraying on 14.12.1953 and 31.1.1954. N applied as A/S and P_2O_5 as Super.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 9' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Nil. (iii) Green fodder and seed yield. (iv) (a) 1953—55. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS ;

Seed yield		Green fodder yield	
(i) 246.3 lb./ac.		(i) 36.56 ton/ac.	
(ii) 48.97 lb./ac.		(ii) 1.30 ton/ac.	
(iii) Treatments are not significantly different.		(iii) Treatments are not significantly different.	
(iv) Av. yield of seed in lb./ac.		(iv) Av. yield of fodder in ton/ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	248.9	1.	36.08
2.	238.5	2.	35.26
3.	259.3	3.	38.74
4.	238.5	4.	36.15
S.E./mean	= 19.99 lb./ac.	S.E./mean	= 0.51 ton/ac.

Crop :- Berseem.

Ref :- Pb. 53(55).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :- To study the effect of application of fertilizers at different times during the growth of crop on seed setting of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium loamy. (b) Refer soil analysis, Sirsa. (iii) 28.9.1953. (iv) (a) 3 ploughs, 2 plankings and 1 horse-hoe. (b) N.A. (c) 2 chh./plot. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) 1 weeding. (ix) 10.26". (x) 1st cut 24.11.1953 to 2.12.1953, 2nd cut—15.1.1954 to 21.1.1954, 3rd cut—28.2.1954 to 5.3.1954 and 4th cut—27.5.1954 to 28.5.1954.

2. TREATMENTS :

Date of application of fertilizers

At sowing time (on 28.9.1953)	After 3rd cutting (on 18.3.1954)
1. Control	
2. P ₂ O ₅ at 100 lb./ac.	+ Nil.
3. P ₂ O ₅ at 50 lb./ac.	+ 50 lb./ac. of P ₂ O ₅ .
4. P ₂ O ₅ at 50 lb./ac.	+ 50 lb./ac. of P ₂ O ₅ +25 lb./ac. of N.
5. Nil	+ 100 lb./ac. of P ₂ O ₅ .
6. Nil	+ 100 lb./ac. of P ₂ O ₅ +25 lb./ac. of N

P₂O₅ as Super and N as A/S by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 6. (b) N.A. (ii) 6. (iv) (a) and (b) 7'×62'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Both germination and growth good. (ii) Nil. (iii) Green fodder and grain weight. (iv) (a) 1953—55. (b) - . (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) For 1st 3 cuttings green fodder weight was taken and for the final (4th) cut grain yield was taken.

5. RESULTS :

Seed Yield		Green Fodder yield	
(i) 325.8 lb./ac.		(i) 35.33 ton/ac.	
(ii) 56.07 lb./ac.		(ii) 1.57 ton/ac.	
(iii) Treatments are not significantly different.		(iii) Treatments are not significantly different.	
(iv) Av. yield of seed in lb./ac.		(iv) Av. yield of fodder in lb./ac.	
Treatment	Av. yield	Treatment	Av. yield
1.	350.6	1.	35.27
2.	335.5	2.	36.41
3.	281.8	3.	36.75
4.	352.7	4.	35.92
5.	326.9	5.	33.92
6.	307.6	6.	33.73
S.E./mean	= 22.89 lb /ac.	S.E /mean	= 0.64 ton/ac.

Crop :- Berseem.

Ref :- Pb. 48(22).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'C'.

Object :- To study the suitable time for Berseem to be left to set seed after taking final cutting.

1. BASAL CONDITIONS .

(i) (a) Nil. (b) *Chari*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 23.9.1948. (iv) (a) 3 *desi*, 1 horse hoe and 3 *sohaga*. (b) to (e) N.A. (v) 10 C.L. of F.Y.M. on 20.9.1948, A/S 123 lb. on 26.2.1948. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 7.30". (x) 10.6.1949.

2. TREATMENTS :

1. Berseem left to set seed after taking final cutting on 29.2.1949.
2. Berseem left to set seed after taking final cutting on 31.3.1949.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) 1/32 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 309.9 lb./ac.

(ii) 40.96 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	308.6
2.	311.1
S.E./mean	= 14.48 lb./ac.

Crop :- Berseem.

Ref :- Pb. 48(46).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'C'.

Object :—To determine the optimum interval between two successive cuttings of Berseem to get maximum yield of green fodder.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 31.9.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.90°. (x) 16.11.1948 to 15.5.1949.

2. TREATMENTS :

Interval between two berseem cuttings.

1. 30 days interval through out.

2. 40 days interval through out.

3. 40 days to start with up to Feb., after which 30 days interval up to the end.

3. DESIGN :

(i) R B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 35.31 ton/ac.

(ii) 2.90 ton/ac.

(iii) Treatments are highly significantly different.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	30.96
2.	36.43
3.	38.55
S.E./mean	= 1.18 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- Pb. 49(38).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CM'.

Object :—To study the influence of F.Y.M. on forage and seed yield of Berseem at different cutting intervals.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 26.9.1949. (iv) (a) 1 *raja*, 3 *desi hal* and 4 *sohaga*. (b) N.A. (c) 8.25 *tola*/plot. (d) and (e) N.A. (v) Nil. (vi) *Mascavi*. (vii) Irrigated. (viii) Nil. (ix) 3.49". (x) 2.11.1949, 1.1.1950 and 8.2.1950.

2. TREATMENTS :

Main-plot treatments :

3 levels of manure : M_0 =Control, M_1 =Medium dose of 375 md./ac. of F.Y.M. and M_2 =High dose of 750 md./ac. of F.Y.M.

Sub-plot treatments :

3 intervals between cuttings : D_1 =30 days, D_2 =30—40 days and D_3 =40 days.
F.Y.M. applied on 8, 9.9.1949.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 62.22'x7'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) Nil. (vii) Each sub-plot is replicated twice in each main-plot.

5. RESULTS :

- (i) 25.82 ton/ac.
(ii) (a) 6.655 ton/ac.
(b) 6.120 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

	D_1	D_2	D_3	Mean
M_0	24.32	26.25	22.65	24.41
M_1	21.48	27.38	26.04	24.97
M_2	26.43	29.87	27.95	28.08
Mean	24.08	27.83	25.55	25.82

S.E. of difference of two

1. M marginal means =1.922 ton/ac.
2. D marginal maans =1.766 ton/ac.
3. D means at the same level of M =3.060 ton/ac.
4. M means at the same level of D =3.152 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- Pb. 49(24).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'T'.

Object :—To study the effect of irrigation on grain yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Maize*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Jullundur. (iii) 12.10.1949. (iv) (a) 5 *desi* ploughing, 4 *sohaga* and 1 roller. (b) N.A. (c) 16 sr./ac. (d) and (e) N.A. (v) Nil. (vi) *Mascavi*. (vii) Irrigated. (viii) 2 md. of A/S added on 28.11.1949. (ix) 6.14". (x) 30/31.5.1950.

2. TREATMENTS :

Irrigations.

1. 6 days interval.
2. 9 days interval.
3. 12 days interval.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/32 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Germination good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 579.2 lb./ac.
- (ii) 60.83 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	808.5
2.	635.0
3.	294.2
S.E./mean	= 24.83 lb./ac.

Crop :-Berseem (*Rabi*).

Ref :-Pb. 51(69).

Site :-Govt. Agri. Stn., Gurdaspur.

Type :-'D'.

Object :-To study the effect of inoculation of Berseem seed on forage yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Loam. (b) N.A. (iii) 21.10.1951. (iv) (a) 2 *dest hal* and 3 *sohaga* and 1 roller. (b) N.A. (c) 5 sr./ac. (d) and (e) N.A. (v) F.Y.M. at 2 C.L. to the area on 19.10.1951. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 7.03%. (x) 15.12.1951 to 27.2.1952. (3 cuttings).

2. TREATMENTS :

1. Control (uninoculated seed).
2. Inoculated seed.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 18' x 63.75'. (v) Nil. (vii) Yes.

4. GENERAL :

(i) Growth normal, germination fair. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) and (c) —. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.23 ton/ac.
- (ii) 1.21 ton/ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	16.09
2.	22.36
S.E./mean	=0.49 ton/ac.

Crop :- Berseem.

Ref :- Pb. 51(27).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'D'.

Object :—To study the effect of inoculation of Berseem seed on forage yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 29.10.1951. (iv) (a) 1 *raja* plough, 4 *desi* plough, 4 *sohaga* and 2 horse hoc. (b) N.A. (c) 10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 2 80°. (x) 29.12.1951, 3.2.1952, 26.3.1952 and 21.4.1952.

2. TREATMENTS :

1. Untreated seed sown.
2. Inoculated seed sown.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 12'×110'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951—1954. (b) No. (c) Nil. (v) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 32.48 ton/ac.
(ii) 1.21 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	31.78
2.	32.79
S.E./mean	=0.49 ton/ac.

Crop :- Berseem (*Rabi*).

Ref :- Pb. 52(103).

Site :- Govt. Agri. Stn., Hansi.

Type :- 'D'.

Object :—To study the effect of inoculation of seed on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 50 lb./ac. of N as A/S in 2nd week of January 1952. (ii) (a) Loam. (b) N.A. (iii) 23.10.1952. (iv) (a) 6 *desi* plough, and 3 *sohaga*. (b) N.A. (c) 8-10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 1.86°. (x) 27.12.1952, 25.2.1953, 5.4.1953 2 5.1953.

2. TREATMENTS :

1. Uninoculated seed sown.
 2. Inoculated seed sown.
- One quarter culture tin and one chattack of *gur* utilized for inoculating Berseem seed.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 12'×60.5'. (b) 12'×60.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 27.19 ton/ac.
(ii) 1.55 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	26.80
2.	27.57
S.E./mean	= 0.63 ton/ac.

Crop :- Berseem (*Rabi*).
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 52(102).
Type :- 'D'.

Object :—To study the effect of inoculation of seed on yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) 50 lb./ac. of N as A/S in 2nd week of Jan 1952. (ii) (a) Loam. (b) N.A. (iii) 23.11.1952, (iv) (a) 7 *desi* plough, and 3 *sohaga*. (b) N.A. (c) 8-10 sr./ac. (d) and (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 1.86". (x) 24.2.1953, 20.3.1953, 4.4.1953, 1.5.1953.

2. TREATMENTS :

1. Uninoculated seed sown.
2. Inoculated seed sown.

One quarter culture tin and one chattack *gur* utilized for inoculating Berseem seed on 22.10.1952.

3. DESIGN :

(i) Paired plot. (i) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 12' × 60.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

RESULTS :

- (i) 26.29 ton/ac.
- (ii) 1.71 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	26.23
2.	26.34
S.E./mean	=0.65 ton/ac.

Crop :- Berseem.
Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 53 (123).
Type :- 'D'.

Object :—To study the effect of inoculation on forage yield of Berseem.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Janter* fodder (for green manuring). (c) Nil. (ii) (a) Heavy loam. (b) N.A. (iii) 1.11.1953. (iv) (a) 3 *desi*, 1 *sohaga*, 2 roller and 1 horse hoe. (b) to (e) N.A. (v) *Janter* (fodder) ploughed in the field for green manuring. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 4.50". (x) 15.1.1954, 7.3.1954 and 18.4.1954.

2. TREATMENTS :

1. Control.
2. Berseem seed inoculated.

3. DESIGN :

(i) Paired plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 12' × 30.25'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 103.03 ton/ac.
(ii) 3.75 ton/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	102.27
2.	103.78
S.E./mean	= 1.53 ton/a.c.

Crop :- Lucerne.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 50 (31).
Type :- 'C'.

Object :- To study the effect of spacing on the yield of Lucerne.

1. BASAL CONDITIONS :

- (i) N.A. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) No. 9.
(v) 23.10.1949. (vi) Nil. (vii) N.A. (viii) Nil. (ix) Nil. (x) Irrigated. (xi) 1.10". (xii) 18.5.1950.

2. TREATMENTS :

1. 1' spacing.
2. 1½' spacing.
3. 2' spacing.

3. DESIGN :

- (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 12. (iv) (a) 1/42.52 ac. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Seed setting poor. (ii) Seed setting poor due to severe attack of lucerne aphids. (iii) Seed yield.
(iv) (a) No. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 108.63 lb./ac.
(ii) 18.69 lb./ac.
(iii) Treatment effects are highly significant.
(iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	91.16
2.	111.94
3.	122.79
S.E./mean	= 5.40 lb./ac.

Crop :- Lucerne.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 51(104)
Type :- 'C'.

Object :- To study the effect of cutting intervals on forage yield of Lucerne.

1. BASAL CONDITIONS :

- (i) Previous wheat crop, no manuring given to wheat. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) Raised from seed sown on 23.10.1950. (iv) Lucerne No. 8. (v) 1' row to row. (vi) Nil. (vii) N.A. (viii) 1 weeding cum hoeing. (ix) N.A. (x) Irrigated. (xi) Period of expt. 1.66". (xii) N.A. But forage yield was taken upto 30.6.1951 for the experiment.

2. TREATMENTS :

Cutting intervals :

1. Cutting after 30 days.
2. Cutting after 40 days.
3. Cutting after 50 days.
4. Cutting between 30-40 days.
5. Cutting between 40-50 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) Net area. 1/132 ac. (v) N.A. (vi) Yes.

GENERAL :

(i) Normal. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) N.A. (v) N.A. (vi) and (vii) Nil.

RESULTS :

- (i) 42.88 ton/ac.
 (ii) 3.75 ton/ac.
 (iii) Treatment effects are highly significant.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	34.19
2.	46.95
3.	48.87
4.	38.79
5.	45.58
S.E./mean	= 1.53 ton/ac.

Crop :- Lucerne.

Ref :- Pb. 52(37).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'C'.

Object :- To find the best time for leaving the crop for seed after taking final cutting of forage.

1. BASAL CONDITIONS :

(i) N.A. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) By seed (iv) Lucerne No. 9 (standard). (v) 13.11.1951. (vi) Nil. (vii) Nil. (viii) Nil. (ix) Nil. (x) Irrigated. (xi) 9.21". (xii) End of May, 1953.

2. TREATMENTS :

Date of final cuttings after which the crop was left for seed setting.

1. 15.12.1952 (control).
2. 15.1.1953.
3. 15.2.1953.
4. 15.3.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Actual forage yield prior to leaving the crop for setting seed and seed yield per plot. (iv) (a) No. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 137.38 lb./ac.
 (ii) 35.32 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	224.23
2.	143.74
3.	87.17
4.	94.37
S.E./mean	= 10.20 lb./ac.

Crop :-Lucerne.
Site :-Fodder Res. Stn., Sirsa.

Ref :-Pb. 50(33).
Type :-'C'.

Object :-To find out suitable time for leaving the crop for seed setting after taking final cuttings of forage.

1. BASAL CONDITIONS :

(i) Fallow. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. (v) Crop was sown by hand drill on 22.10.1949 in rows 1' apart. (vi) Nil. (vii) Nearly 24 C.L./ac. F.Y.M. as basal dose in the month of May 1949. (viii) and (ix) Nil. (x) Irrigated. (xi) 1.66". (xii) Middle of June 1950.

2. TREATMENTS :

Date of leaving the crop for seed after taking final cuttings on :-

- | | |
|--|--|
| 1. No cutting. | 7. 12.2.1950 after taking two cuttings. |
| 2. 1.1.1950 after taking one cutting. | 8. 3.3.1950 after taking two cuttings. |
| 3. 21.1.1950 after taking one cutting. | 9. 24.3.1950 after taking two cuttings. |
| 4. 12.2.1950 after taking one cutting. | 10. 3.3.1950 after taking three cuttings. |
| 5. 3.3.1950 after taking one cutting. | 11. 24.3.1950 after taking three cuttings. |
| 6. 24.3.1950 after taking one cutting. | |

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) 1/220 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth satisfactory. (ii) Nil. (iii) Seed yield. (iv) (a) 1950-1951. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 197.7 lb./ac.
(ii) 33.63 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of seed in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	378.1	7.	169.7
2.	279.1	8.	124.5
3.	247.0	9.	112.2
4.	287.6	10.	145.2
5.	180.1	11.	106.5
6.	144.3		
	S.E./mean		=13.73 lb./ac.

Crop :-Lucerne.
Site :-Fodder Res. Stn., Sirsa.

Ref :-Pb. 51(105)/50(33).
Type :-'C'.

Object :-To find suitable time for leaving the crop for setting seed after taking its final cutting for fodder.

1. BASAL CONDITIONS :

(i) Previous crop wheat; No manuring. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. 8. (v) Sown on 28.10.1950. Spacing 9" row to row. (vi) Nil. (vii) 24 C.L./ac. of F.Y.M. in May-June 1950. (viii) and (ix) Nil. (x) Irrigated. (xi) 1.66". (xii) July 1951.

2. TREATMENTS :

Date of leaving the crop for seed after taking final cutting on :

- | | |
|----------------------------------|------------------------------------|
| 1. No cut at all. | 7. 12.2.1951 after taking 2 cuts. |
| 2. 1.1.1951 after taking 1 cut. | 8. 3.3.1951 after taking 2 cuts. |
| 3. 21.1.1951 after taking 1 cut. | 9. 24.3.1951 after taking 2 cuts. |
| 4. 12.2.1951 after taking 1 cut. | 10. 3.3.1951 after taking 3 cuts. |
| 5. 3.3.1951 after taking 1 cut. | 11. 24.3.1951 after taking 3 cuts. |
| 6. 24.3.1951 after taking 1 cut. | |

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) 1/224 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Seed yield. (iv) (a) 1950—1951. (b) N.A. (v) N.A. (vi) and (vii) Nil

5. RESULTS :

- (i) 160.4 lb./ac.
 (ii) 36.38 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of seed in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	265.0	7.	149.8
2.	180.5	8.	136.3
3.	191.0	9.	116.2
4.	199.7	10.	95.0
5.	181.4	11.	110.4
6.	139.2		

S.E./mean = 14.85 lb./ac.

Crop :- Lucerne.

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 53(61).

Type :- 'CM'.

Object :- To study the effect of manuring, spacing and seed rate on seed yield of Lucerne.

1. BASAL CONDITIONS :

(i) Previous crops were Cow peas—Fallow—Wheat—Fallow. No manure to the previous crops. (ii) (a) Sandy loam. (b) Refer soil analysis, Sirsa. (iii) Propagation by seed. (iv) Lucerne no. 9. (v) Seed sown on 17, 18, 11.1953 as under treatments. Seed sown by broadcast and by hand drill. (vi) Nil. (vii) Nil. (viii) 4 hoeings with hand hoe to remove weeds and with hand on 12 and 15.2.1954. (ix) Nil. (x) Irrigated. (xi) 4.59". (xii) 9, 12, 5.1954.

2. TREATMENTS :

Main-plot treatments :

5 levels of manures : M_0 = Control, M_1 = 100 lb./ac. of P_2O_5 , M_2 = 100 lb./ac. of P_2O_5 + 50 lb./ac. of K_2O , M_3 = 100 lb./ac. of P_2O_5 + 50 lb./ac. of K_2O + 25 lb./ac. of N in A/S and M_4 = Treatment M_3 + trace elements.

Sub-plot treatments :

3 levels of spacing : S_0 = Broadcast, S_1 = 1½' between rows and S_2 = 2' between rows.

Sub-sub-plot treatments :

3 seed rates : R_1 = 2 sr., R_2 = 3 sr. and R_3 = 4 sr./ac.

Trace elements include : (a) Copper Sulphate at 24 lb./ac. (b) Manganese Sulphate at 48 lb./ac. (c) Zinc Sulphate at 24 lb./ac. (d) Borax at 12 lb./ac. (e) Sodium Molybdate at 60 lb./ac. P_2O_5 as Super and K_2O as Pot. Sulphate.

Fertilizers applied on 17.11.1953 and mixed with soil. Fertilizer were applied in rows and seeds were placed with hand drill just over the fertilizer.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 5 main-plots/block ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) Main plot 26' × 63' ; sub-plot with S_1 spacing ; 9' × 63' ; sub-plot with S_2 spacing 8' × 63'. Sub-sub plot for S_1 = 21' × 9', sub-sub plot for S_2 = 21' × 8'. Net plot size = 6' × 18'-2". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Germination count ; population of seedling per square foot, height of crop in cm. No. of inflorescence per ¼ sub-plot, no. of shoot/square ft., no. of inflorescence shoots per branch, no. of flowers inflorescence. No. of pods/inflorescence, no. of grains per pod. (iv) (a) 1953-54. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 210.0 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of seed in lb./ac.

	S ₀	S ₁	S ₂	Mean	R ₁	R ₂	R ₃
M ₀	184.3	268.8	225.7	226.3	225.7	237.8	215.3
M ₁	142.6	196.4	173.6	170.9	185.7	169.5	157.4
M ₂	158.8	218.1	220.6	199.2	209.8	200.6	187.1
M ₃	195.0	246.0	275.1	238.7	236.4	243.3	236.4
M ₄	165.4	225.7	254.0	215.0	216.4	220.2	208.5
Mean	169.2	231.0	229.8	210.0			
R ₁	162.4	244.7	237.3	214.8			
R ₂	174.6	249.5	218.7	214.3			
R ₃	170.6	198.8	233.4	200.9			

S.E.'s N.A.

Crop :- Lucerne.

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 52(36).

Type :- 'CV'.

Object :- To study the forage producing capacity of different varieties along with their intervals of cutting.

1. BASAL CONDITIONS :

- (i) 11 important Lucerne varieties were under observation in comparison with existing variety Lucerne no. 9 since 1951, after taking uniform cutting on 21.10.1952 experiment was started. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) By seed. (iv) See under treatments. (v) 13.11.1951. No spacings. (vi) No. (vii) Nil. (viii) Nil. (ix) No. (x) Irrigated. (xi) 9.21". (xii) Cuttings taken up to 30.6.1953.

2. TREATMENTS :

Main-plot treatments :

12 varieties :

- | | |
|--------------------------------------|--|
| 1. <i>Medicago Sativa Ferax</i> . | 7. <i>M. Sativa—Boobor wie</i> strain. |
| 2. <i>M. Media—M_{50r}</i> . | 8. <i>M. Sativa—M. falcata</i> . |
| 3. <i>M. Media—Grimm</i> . | 9. <i>M. Sativa—S. 10230</i> . |
| 4. <i>M. Media—Viking</i> . | 10. Lucerne <i>Grimm</i> . |
| 5. <i>M. Media—Canute</i> . | 11. Lucerne <i>Ladak</i> . |
| 6. <i>M. Sativa—Hunter rives</i> . | 12. Lucerne No. 9 (Standard). |

Sub-plot treatments :

3 cutting intervals : C₁=21 days, C₂=28 days and C₃=35 days.

3. DESIGN :

- (i) Split-plot. (ii) (a) 12 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) Plot size net. 1/774 ac. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Good. (ii) Nil. (iii) Height in cm. on 11.2.1953 and forage yield. (iv) (a) and (b) No. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15021 lb./ac.
(ii) (a) 3364.8 lb./ac.
(b) 3426.8 lb./ac.
(iii) All the effects are highly significant.

(iv) Av. yield of fodder in lb./ac.

	C ₁	C ₂	C ₃	Mean
V ₁	5506	11311	15292	10703
V ₂	7961	14098	18974	13678
V ₃	8260	17614	20633	15502
V ₄	5772	9354	14396	9841
V ₅	4113	6468	9786	6789
V ₆	10184	13600	24315	16033
V ₇	8492	11477	22789	14253
V ₈	10582	14363	24680	16542
V ₉	8691	14131	31148	17990
V ₁₀	10980	10847	17614	13147
V ₁₁	8525	12373	16685	12528
V ₁₂	23784	27400	48563	33249
Mean	9404	13586	22073	15021

S.E. of difference of two

1. V marginal means = 1585.9 lb./ac.
2. C marginal means = 807.5 lb./ac.
3. C means at the same level of V = 2798.0 lb./ac.
4. V means at the same level of C = 2781.2 lb./ac.

Crop :- Lucerne.

Ref :- Pb. 50(34).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CP'.

Object :—To study the influence of irrigation with final cutting of forage on the yield of Lucerne seed.

1. BASAL CONDITIONS :

(i) Previous crop was wheat and a manure was given to wheat. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. 8. (v) Sown on 22.10.1949 by hand drill at 1' apart rows. (vi) Nil. (vii) Nearly 24 C.L./ac. of F.Y.M. as basal dose in the month of May, 1949. (viii) Nil. (ix) Nil. (x) Irrigated. (xi) 1.66". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of irrigations : I₁=Low (3 to 4 irrigations), I₂=Medium (3 to 5 irrigations) and I₃=Liberal (4 to 6 irrigations).

(2) 4 dates of final cutting : D₀=No cut, D₁=15.1.1950 D₂=15.2.1950 and D₃=15.3.1950.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL

(i) Normal. (ii) Nil. (iii) Seed yield. (iv) (a) 1950-1951. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 147.9 lb./ac.
- (ii) 33.78 lb./ac.
- (iii) All effects are highly significant.

(iv) Av. yield of seed in lb./ac.

	D ₀	D ₁	D ₂	D ₃	Mean
I ₁	271.5	230.7	49.4	21.6	143.3
I ₂	258.4	165.9	59.4	12.3	124.0
I ₃	393.4	232.2	45.5	33.9	176.3
Mean	307.8	209.6	51.4	22.6	147.9

S.E. of marginal mean of I = 8.45 lb./ac.
 S.E. of marginal mean of D = 9.75 lb./ac.
 S.E. of body of table = 16.89 lb./ac.

Crop :- Lucerne.

Ref :- Pb. 51(106)/50(34).

Site :- Fodder Res. Stn , Sirsa.

Type :- 'CI'.

Object :- To study the influence of irrigation with final cutting of forage on the yield of Lucerne seed.

1. BASAL CONDITIONS :

(i) Previous crop wheat. No manure given to wheat. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) By seed propagation. (iv) Lucerne No. 8. (v) Sown on 4.11.1950. (vi) Nil. (vii) 24 C.L./ac. of F.Y.M. in May-June, 1950. (viii) Nil. (ix) Nil. (x) Irrigated. (xi) 1.66". (xii) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of irrigation : I₁=Restricted (3 to 4 irrigations), I₂=Medium (4 to 5 irrigations) and I₃=Liberal (5 to 6 irrigations).

(2) 4 dates of final cutting : D₀=No cut, D₁=15.1.1951, D₂=15.2.1951 and D₃=15.3.1951.

3. DESIGN :

(i) 4×3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Seed yield. (iv) (a) 1950—1951. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 130.0 lb./ac.
 (ii) 43.2 lb./ac.
 (iii) Only time of final cutting effect is highly significant.
 (iv) Av. yield of seed in lb./ac.

	D ₀	D ₁	D ₂	D ₃	Mean
I ₁	202.9	148.9	78.7	69.4	125.0
I ₂	181.3	151.2	124.2	98.0	138.7
I ₃	158.1	154.3	89.5	103.4	126.3
Mean	180.8	151.5	97.5	90.3	130.0

S.E. of marginal mean of I = 10.82 lb./ac.
 S.E. of marginal mean of D = 12.49 lb./ac.
 S.E. of body of table = 21.63 lb./ac.

Crop :- *Chari*.

Ref :- Pb. 50 (78).

Site :- Distt. Demonstration Farm, Ambala.

Type :- 'M'.

Object :- To find the best source of N for forage yield of *Chari*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Hard clay. (b) N.A. (iii) 16.7.1950. (iv) (a) and (b) N.A.
 (c) 5 sr./plot. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 28.31". (x) 26.11.1950.

2. TREATMENTS :

All combinations of (1) and (2)+one control (no manure)

(1) 2 levels of N : $N_1=50$ and $N_2=75$ lb./ac.(2) 3 sources of N : $S_1=A/S$, $S_2=Ammono. Phos.$ and $S_3=F.Y.M.$

F.Y.M. applied on 16.7.1950, A/S and Ammono. Phos. applied on 4.8.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) $67.25' \times 12'$. (b) $67.25' \times 12'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —.
 (vi) and (vii) Nil.

5. RESULTS :

(i) 13793 lb./ac.

(ii) 1521.9 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of forage in lb./ac.

	Control=13409 lb./ac.		Mean
	N_1	N_2	
S_1	13409	13270	13340
S_2	14408	13325	13867
S_3	14380	14353	14367
Mean	14066	13649	13857

S.E. of marginal mean of N

=439.3 lb./ac.

S.E. of marginal mean of S

=538.1 lb./ac.

S.E. of body of table

=760.9 lb./ac.

Crop :- *Guara*.

Ref :- Pb. 53 (52).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :- To study the effect of application of phosphatic fertilizers on seed yield of *Guara*.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 17.7.1953.
 (iv) (a) 2 ploughings and 1 planking. (b) Broadcast. (c) 10 sr./ac. (d) and (e) —. (v) Nil. (vi) *Guara*
 no. 2. (vii) Irrigated. (viii) Nil. (ix) 15.67". (x) 25.11.1953 to 28.11.1953.

2. TREATMENTS :

1. No manure.

2. 30 lb./ac. of P_2O_5 as Super.3. 60 lb./ac. of P_2O_5 as Super.

Fertiliser applied on 5.7.1953 by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 26'×132'. (v) No. (vi) Yes.

4. GENERAL

(i) Good and seed setting satisfactory. (ii) Nil. (iii) Fodder. yield. (iv) (a) 1953 to 1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1323 lb./ac.
 (ii) 125.8 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of fodder in lb./ac.

Treatment	Av. yield
1.	1318
2.	1279
3.	1371
S.E./mean	= 62.9 lb./ac.

Crop :- Sudan grass

Ref :- Pb. 53(50).

Site :- Fodder Res. Stn., Sirsa

Type :- 'M'.

Object :- To study the maximum potential forage yield of Sudan grass.

1. BASAL CONDITIONS :

(i) (a) *Guara*-Fallow-Sudan grass. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil. analysis, Sirsa. (iii) 9.4.1953. (iv) (a) 2 ploughings and 1 planking. (b) Broadcast. (c) 7.5 sr./ac. (d) & (e) —. (v) Nil. (vi) Common Sudan grass. (vii) Irrigated. (viii) Nil. (ix) 17.16". (x) 1st. cut—27.5.1953 to 9.6.1953, 2nd cut—12.7.1953 to 31.7.1953, 3rd. cut—28.8.1953 to 19.9.1953

2. TREATMENTS :

- F.Y.M at 125 lb./ac. of N.
- F.Y.M. at 250 lb./ac. of N.
- A/S and C/N at 125 lb./ac. of N.
- A/S and C/N at 250 lb./ac. of N.
- F.Y.M. at 125 lb./ac. of N and A/S at 125 lb./ac. of N.
- A/S and C/N at 125 lb./ac. of N + Super at 62.5 lb./ac. of P_2O_5 .
- A/S and C/N at 250 lb./ac. of N + Super at 125 lb./ac. of P_2O_5 .
- Control.

N Applied, $\frac{1}{3}$ at the time of sowing as A/S, 2/3 in 3 equal doses on 28.4.1953, 19.6.1953 and 29.7.1953 as C/N.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) & (b) 8.5'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No Lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS :

- (i) 31.31 ton/ac.
 (ii) 2.19 ton/ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	25.60
2.	36.99
3.	28.29
4.	30.44
5.	31.02
6.	35.99
7.	38.08
8.	24.05
S.E./mean	= 0.89 ton/ac.

Crop :- Sudan grass (*Kharif*).
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 49(33)
Type :- 'C'.

Object :—To study the forage yielding capacity of Sudan grass along with other non-leguminous fodder crops.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Rapes. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 4.5.1949. (iv) (a) to (e) N.A. (v) 15 C.L./ac. of F.Y.M. to the area from 14.2.1949 to 16.2.49. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 5.53". (x) All except teosinte 1st. cut—26.6.49 to 1.8.49. 2nd. cut—23.8.49 to 13.9.49. Teosinte gave one cutting 23.8.49 to 1.9.49.

2. TREATMENTS :

1. Jowar Js. 263.
2. Teosinte.
3. Bajra.
4. Sudan grass.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) & (b) 5'-6" × 132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Germination and growth good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) Not continued. (b) —. (c) —. (v) (a) Nil. (b) —. (vi) & (vii) Nil.

5. RESULTS :

- (i) 28.38 ton./ac.
(ii) 3.26 ton./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of fodder in ton./ac.

Treatment	Av. yield
1.	31.49
2.	26.78
3.	27.53
4.	27.73
S.E./mean	= 1.33 ton/ac.

Crop :- Teosinte (*Kharif*).
Site :- Foder Res. Stn , Sirsa.

Ref :- Pb. 49(35).
Type :- 'C'.

Object :—To study the variation in the seed yield as a result of variation in seed rate when sown late.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 5.8.1949. (iv) (a) 1 *raja* plough, 5 *desi hal* and 4 *sohaga*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) F.Y.M. at 3 C.L. on 26.6.1949. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 6.84". (x) 6.11.1949.

2. TREATMENTS :

- Seed rates.
1. 4 sr./ac.
 2. 5 sr./ac.
 3. 6 sr./ac.
 4. 7 sr./ac.
 5. 8 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii).6. (iv) (a) and (b) 8'-3" × 132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Medium vegetation growth. No lodging. (ii) Attack of borer. (iii) Height of plant; thickness of stalk, no. of node bearing cobs, total no. and weight of grain/plant, % attack of borer and grain yield. (iv) (a) No. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 611.3 lb./ac.
 (ii) 129.77 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	622.3
2.	581.1
3.	613.7
4.	596.6
5.	642.9
S.E./mean	= 52.98 lb./ac.

Crop :- Teosinte (*Kharif*).

Ref :- Pb. 49(34).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'C'.

Object :—To study the variation in seed yield as a result of variation in seed rate when sown early.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 23.6.1949. (iv) (a) 1 *raja* plough, 3 *desi* and 4 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) 6.84". (x) 6,7.12.1949.

2. TREATMENTS :

Seed rates.

1. 4 sr./ac.
2. 5 sr./ac.
3. 6 sr./ac.
4. 7 sr./ac.
5. 8 sr./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 8'-3" x 132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) High luxuriant, vegetative growth, seed setting poor. No lodging. (ii) Attack of borer. (iii) Height of plant, thickness of stalk, no. of pods bearing cobs, total no. and weight of grain/plant, % attack of borer and grain yield. (iv) (a) Not contd. (b)—, (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 594.5 lb./ac.
 (ii) 383.1 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	594.9
2.	592.3
3.	623.1
4.	570.9
5.	591.4
S.E./mean	= 156.4 lb./ac.

Crop :- Teosinte.

Ref :- Pb. 53(59).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'C'.

Object : To find out best spacing for Teosinte seed crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loamy (heavy loam). (b) Refer soil analysis, Sirsa. (iii) 26.7.1953. (iv) (a) 1 *raja* plough, 1 *desi* plough and 1 planking. (b) N.A. (c) $\frac{1}{2}$ *chattack*/line of 32'. (d) As per treatments. (e) N.A. (v) Nil. (vi) Teosinte, only this variety exists. (vii) Irrigated. (viii) 2 weedings and hoeings. (ix) 15.81". (x) 9.1.1954.

2. TREATMENTS :

1. 1' spacing from line to line.
2. 1½' spacing from line to line.
3. 2' spacing from line to line.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 36' × 132'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) 1953 to 1955. (b) Nil. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1030 lb./ac.
- (ii) 241.5 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of seed in lb./ac.

Treatment	Av. yield
1.	962
2.	1050
3.	1078
S.E./mean	=98.6 lb./ac.

Crop :- Teosinte (*Khari*f).

Ref :- Pb. 51(99).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'IM'.

Object :—To study the response of Teosinte to various agronomical factors.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Sirsa. (iii) 26.7.1951. (iv) (a) 1 *raja*, 4 *desi* plough and 6 *sohaga*. (b) N.A. (c) 9 *chks.* 2 *tola*/plot. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 4.70". (x) 15.10.1951 to 2.11.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 manures : M_1 =Control, M_2 =60 lb./ac. of N as A/S, M_3 =16 tons of F.Y.M., M_4 =8 tons of F.Y.M.+30 lb./ac. of N as A/S.

(2) 3 levels of irrigation : I_1 =Irrigation after 3 weeks (low), I_2 =Irrigation after 2 weeks (medium), I_3 =Irrigation after 1 week (high).

F.Y.M. applied on 18,20.7.1951, $\frac{1}{2}$ dose of A/S on 26.7.1951 and $\frac{1}{4}$ on 9.9.1951.

3. DESIGN :

(i) R.B.D. (Factorial). (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/120th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Growth was good in high irrigated plots and poor in low irrigated plots. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 21.18 ton/ac.
 (ii) 4.315 ton/ac.
 (iii) Manure effect is highly significant. Irrigation effect and interaction irrigation × manures are not significant.
 (iv) Av. yield of fodder in ton/ac.

	M ₁	M ₂	M ₃	M ₄	Mean
I ₁	18.51	19.12	19.84	20.66	19.53
I ₂	17.30	18.32	23.61	24.99	21.06
I ₃	16.97	24.30	28.55	22.04	22.96
Mean	17.59	20.58	24.00	22.56	21.18

S.E. of marginal mean of manures = 1.246 ton/ac.
 S.E. of marginal mean of irrigation = 1.079 ton/ac.
 S.E. of body of table = 2.157 ton/ac.

Crop :- Teosinte.

Ref :- Pb. 52(29).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'IM'.

Object :- To study the influence of irrigation and fertilizer treatment on yield of Teosinte.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 13.7.1952. (iv) (a) 5 *desi* plough, 1 horse hoe and 1 *sohaga*. (b) Broadcast. (c) 16 sr./ac. (d) and (e) —. (v) Nil. (vi) Teosinte (only one variety exists). (vii) Irrigated. (viii) 1 hoeing and weeding. (ix) 6.57". (x) 4.10.1952 to 23.10.1952.

2. TREATMENTS :

Main-plot treatments :

3 levels of irrigation : I₁ = Irrigation after one week, I₂ = Irrigation after two weeks and I₃ = Irrigation after three weeks.

Sub-plot treatments :

4 manures : M₁ = Control, M₂ = 75 lb./ac. of N as A/S, M₃ = 75 lb./ac. of N as F.Y.M. and M₄ = 37.5 lb./ac. of N as A/S + 37.5 lb./ac. of N as F.Y.M.

Date of application of fertilizers not available.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot (a) 10' × 64'. (b) 10' × 61'. (v) 3' buffer plots in between the experimental plots and 3 foot border left on irrigation channel side. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Fodder yield/plot. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15.27 ton/ac.
 (ii) (a) 7.254 ton/ac.
 (b) 3.895 ton/ac.
 (iii) Main-plot treatment effect is significant, sub-plots treatment effect is highly significant while interaction between them is not significant.

(iv) Av. yield of fodder in ton/ac.

	M ₁	M ₂	M ₃	M ₄	Mean
I ₁	13.18	21.89	20.10	23.20	19.59
I ₂	10.54	18.43	15.62	14.97	14.89
I ₃	8.59	13.13	10.54	13.10	11.34
Mean	10.77	17.82	15.42	17.09	15.27

S.E. of difference of two

1. I marginal means =2.564 ton/ac.
2. M marginal means =1.589 ton/ac.
3. M means at a level of I =2.754 ton/ac.
4. I means at a level of M =3.502 ton/ac.

Crop :-Oats.

Ref :-Pb. 48(55).

Site :-Govt. Agri. Stn., Hansi.

Type :-'M'.

Object :-To study the residual effect of organic manure applied to previous crop of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Loam. (b) N.A. (iii) 19.12.1948. (iv) (a) and (b) N.A. (c) 12 chh./plot. (d) and (e) N.A. (v) Nil. (vi) Weston 11. (vii) Irrigated. (viii) Nil. (ix) 0.71". (x) 18.4.1949.

. TREATMENTS :

Manure applied to previous cotton crop.

1. Town compost at 10 ton/ac.
2. Farm compost at 10 ton/ac.
3. Control.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 12' x 74'-4". (b) 1/60] ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Very poor. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) and (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3130 lb./ac.
- (ii) 437.1 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3171
2.	3024
3.	3194
S.E./mean	=154.6 lb./ac.

Crop :-Oats (Rabi).

Ref :-Pb. 51(101).

Site :-Fodder Res. Stn., Sirsa.

Type :-'M'.

Object :-To study the effect of varying doses of fertilizers on forage yield of Oats.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 27.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Weston-11 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.30". (x) 14.3.1952 to 20.3.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.

(2) 5 manurial doses : $M_0=0$, $M_1=20$ lb./ac. of N as A/S, $M_2=40$ lb./ac. of N as A/S, $M_3=20$ lb./ac. of N as C/N and $M_4=40$ lb./ac. of N as C/N.

A/Sand C/N applied on 12.1.1952. Date of application of lime N.A.

3. DESIGN

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) $8.5' \times 65'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging, (ii) Nil. (iii) Forage yield/plot. (iv) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.12 ton/ac.

(ii) 1.96 ton/ac.

(iii) Over all treatment effect is highly significant. Manures effect is highly significant while others are not significant.

(iv) Av. yield of fodder in ton/ac.

	M_0	M_1	M_2	M_3	M_4	Mean
L_0	11.64	13.33	11.85	12.95	14.42	12.84
L_1	10.93	13.68	13.88	13.12	15.40	13.40
Mean	11.28	13.50	12.86	13.04	14.91	13.12

S.E. of marginal mean of lime = 0.358 ton/ac.

S.E. of marginal mean of N doses = 0.566 ton/ac.

S.E. of body of table = 0.801 ton/ac.

Crop :- Oats.

Ref :- Pb. 52(33).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :- To study the effect of fertilizers on yield of Oats.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) Fallow, (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 28.11.1952. (iv) (a) 4 *desi* plough, 1 bar harrow and 1 *sohaga*. (b) N.A. (c) 9 chk./plot. (d) and (e) N.A. (v) Nil. (vi) Weston-11 (medium). (vii) Irrigated. (viii) 2 weedings and hoeings. (ix) 0.89". (x) 24.3.1953, 26.3.1953 and 28.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.

(2) 5 manurial doses : $M_0=0$, $M_1=20$ lb./ac. of N as A/S, $M_2=40$ lb./ac. of N as A/S, $M_3=20$ lb./ac. of N as C/N and $M_4=40$ lb./ac. of N as C/N.

$\frac{1}{2}$ amount of the fertilizer was applied on 28.11.1952 and the rest half applied on 4.1.1953 before watering, by broadcast.

3. DESIGN :

(i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) $13' \times 64'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Crop dried early due to lack of irrigation. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) Nil. (vii) The growth of crop was satisfactory to start with. But the dry weather influenced the crop adversely which had to be cut in withered state.

5. RESULTS :

- (i) 8.02 ton/ac.
(ii) 0.941 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	Mean
L ₀	7.12	9.20	7.92	8.26	7.52	8.00
L ₁	8.18	7.82	7.93	7.98	8.27	8.04
Mean	7.65	8.51	7.93	8.12	7.90	7.90

S.E. of marginal mean of M = 0.333 ton/ac.
S.E. of marginal mean of L = 0.210 ton/ac.
S.E. of body of table = 0.471 ton/ac.

Crop :- Oats.

Ref :- Pb. 53 (57).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :- To study response of Oats forage to A/S and C/N alone and in combination with lime.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy loam. (b) Refer soil analysis, Sirsa. (iii) 29.10.1953.
(iv) (a) 1 ploughing with *raja* plough, 2 *desi* ploughings, 1 *horse hoe* and 1 planking. (b) Broadcast.
(c) 15 sr./ac. (d) and (e) —. (v) Nil. (vi) ₃Weston -11 (medium, early). (vii) Irrigated. (viii) 2 weedings.
(ix) 4.71". (x) 8.2.1954 to 2.3.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : L₀=0 and L₁=200 lb./ac.(2) 5 manurial doses : M₀=0, M₁=20 lb./ac. of N as A/S, M₂=40 lb./ac. of N as A/S, M₃=20 lb./ac. of N as C/N and M₄=40 lb./ac. of N as C/N.

Treatments applied on 28.10.1953 by broadcast.

3. DESIGN :

- (i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 8.5'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1951 to 1953. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 27.05 ton/ac.
(ii) 2.28 ton/ac.
(iii) None of the effects is significant.
(iv) Av. yield of fodder in ton/ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	Mean
L ₀	25.57	27.10	28.38	25.79	26.89	26.75
L ₁	25.88	27.67	26.47	28.46	28.27	27.35
Mean	25.72	27.38	27.42	27.12	27.58	27.05

S.E. of marginal mean of M = 0.81ton/ac.
S.E. of marginal mean of L = 0.05 ton/ac.
S.E. of body of table = 1.14 ton/ac.

Crop :- Oats.

Ref :- Pb. 50 (26).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'MV'.

Object :- To study the response of different varieties of Oats to manures.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 27.11.1950. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 0.91%. (x) 3.4.1951 to 18.4.1951.

2. TREATMENTS :

Main-plot treatments :

4 manures : M_0 =Control, M_1 =F.Y.M. at 15 ton/ac., M_2 =A/S at 40 lb./ac. of N and M_3 =F.Y.M. at 7½ ton./ac.+A/S at 20 lb./ac. of N.

Sub-plot treatments :

5 varieties : V_1 =Bunker. 10, V_2 =Weston-11, V_3 =Fulghan. 15, V_4 =FOS 1/29 and V_5 =Algeria. 31. F.Y.M. applied on 8.11.1950 and A/S applied to M_2 and M_3 plots on 28.12.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'x63.5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. Growth is normal as there is no lodging. (ii) Nil. (iii) Fodder yield, height in cm., tillering, no. of leaves/plot, size of leaf and yield of fodder. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b)---. (vi) and (vii) Nil.

5. RESULTS :

(i) 13.34 ton/ac.
 (ii) (a) 2.723 ton/ac.
 (b) 1.949 ton/ac.
 (iii) Varieties effect is highly significant while others are not significant.
 (iv) Av. yield of fodder in ton./ac.

	V_1	V_2	V_3	V_4	V_5	Mean
M_0	14.59	13.30	12.96	11.39	13.25	13.10
M_1	14.78	12.65	13.99	10.10	11.50	12.60
M_2	16.45	15.38	14.17	10.76	11.50	13.65
M_3	16.06	13.89	15.51	12.44	12.15	14.01
Mean	15.47	13.81	14.16	11.17	12.10	13.34

S.E. of difference of two

1. M marginal means = 0.86 ton/ac.
2. V marginal means = 0.69 ton/ac.
3. V means at the same level of M = 1.38 ton/ac.
4. M means at the same level of V = 1.50 ton/ac.

Crop :- Oats (*Rabi*),

Ref :- Pb. 51(102).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'MV'.

Object :- To study the response of early and late maturing improved varieties of Oats to different fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 29.11.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 1.30%. (x) 13.3.1952 to 5.4.1952.

2. TREATMENTS :

Main-plot treatments :

4 manures : M_0 =Control, M_1 =F.Y.M. at 15 ton/ac., M_2 =A/S at 40 lb./ac. of N and M_3 =F.Y.M. at $7\frac{1}{2}$ ton/ac.+A/S at 20 lb./ac. of N.

Sub-plot treatments :

5 varieties : V_1 =Bunker. 10, V_2 =Weston-11, V_3 =Fulghan, V_4 =FOS 1/29 and V_5 =Algeria. F.Y.M. applied on 26,28.11.1951 and A/S applied on 12.1.1952.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) $6' \times 60.5'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) No.

5. RESULTS :

(i) 8.20 ton/ac.

(ii) (a) 1.975 ton/ac.

(b) 1.079 ton/ac.

(iii) Effect of manures and varieties are highly significant while their interaction is not significant.

(iv) Av. yield of fodder in ton/ac.

	V_1	V_2	V_3	V_4	V_5	Mean
M_0	7.19	6.72	8.13	6.97	6.94	7.19
M_1	9.17	8.35	8.87	7.77	6.58	8.15
M_2	9.09	8.15	9.50	8.40	9.04	8.84
M_3	9.17	8.65	9.34	8.02	7.88	8.61
Mean	8.65	7.97	8.96	7.79	7.61	8.20

S.E. of difference of two

1. M marginal means =0.63 ton/ac.
2. V marginal means =0.38 ton/ac.
3. V means at the same level of M =0.76 ton/ac.
4. M means at the same level of V =0.92 ton/ac.

Crop :- Oats.

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 52(34).

Type :- 'MV'.

Object :- To study the forage yield of different varieties of Oats as influenced by different manures.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Light loam. (b) Refer soil analysis, Sirsa. (iii) 29.11.1952. (iv) (a) 4 *desi* ploughings, 1 bar harrow and 1 *sohaga*. (b) N.A. (c) $4\frac{1}{2}$ *chh.*/plot. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings and hoeings. (ix) 0.89". (x) 20.3.1953 to 24.3.1953 and 26.3.1953 to 30.3.1953.

2. TREATMENTS :

Main-plot treatments :

4 manures : M_0 =Control, M_1 =F.Y.M. at 15 ton/ac., M_2 =A/S at 40 lb./ac. of N. and M_3 =F.Y.M. at $7\frac{1}{2}$ ton/ac.+A/S at 20 lb./ac. of N.

Sub-plot treatments :

5 varieties : V_1 =Bunker. 10 (early), V_2 =Weston-11 (early), V_3 =Fulghan (medium), V_4 =FOS 1/29 (late) and V_5 =Algeria (late).

Manures applied on 29.11.1952 by broadcast.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 68'-5"×68'-9". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1950 to 1952. (b) and (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Late type of varieties; i.e., Algeria and FOS 1/29 gave low yields as they dried up owing to lack of irrigation.

5. RESULTS :

- (i) 11.90 ton/ac.
 (ii) (a) 4.09 ton/ac.
 (b) 2.74 ton/ac.
 (iii) Effect of V's highly significant. Others are not significant.
 (iv) Av. yield of forage in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	Mean
M ₀	11.86	10.98	10.90	10.39	9.46	10.72
M ₁	13.10	12.81	12.08	10.39	10.42	11.76
M ₂	14.03	11.10	13.08	11.03	9.71	11.79
M ₃	15.79	15.40	15.13	10.68	9.66	13.33
Mean	13.70	12.57	12.80	10.62	9.81	11.90

S.E. of difference of two

1. M marginal means =1.29 ton/ac.
2. V marginal means =0.97 ton/ac.
3. V means at the same level of M =1.94 ton/ac.
4. M means at the same level of V =2.16 ton/ac.

Crop :- Oats (*Rabi*).

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 49(43).

Type :- 'CMV'.

Object :- To study the response of late maturing varieties of Oats to sowing dates and application of manure.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) and (b) N.A. (c) FOS 1/29 : 4.8 chh./plot ; Fulghan : 5.0 chh./plot ; Algeria : 5.7 chh./plot. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 3.49". (x) 13.3.1950 to 11.4.1950.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=26.10.1949, D₂=16.11.1949 and D₃=8.12.1949.

Sub-plot treatments :

2 manures : M₀=Control and M₁=A/S at 1 md./ac.

Sub-sub-plot treatments:

3 varieties : V₁=FOS 1/29 (late), V₂=Fulghan. 15 (late) and V₃=Algerian-31/19 (late).

A/S applied to main-plot D₁ on 1.1.1950, to main-plot D₂ on 27.1.1950 and to main-plot D₃ on 22.1.1950.

3. DESIGN ;

(i) Split-plot. (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 63'×71-8". (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) No. (iii) Forage yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5- RESULTS :

- (i) 13.33 ton/ac-
 (ii) (a) 1.81 ton/ac.
 (b) 2.36 ton/ac.
 (c) 1.45 ton/ac.
 (iii) The effect of D is significant. Other effects are not significant.
 (iv) Av. yield of forage in ton/ac.

	V ₁	V ₂	V ₃	Mean	M ₀	M ₁
D ₁	15.47	16.69	15.90	16.02	15.41	16.63
D ₂	10.73	12.07	14.06	12.29	11.53	13.05
D ₃	12.03	12.30	10.73	11.69	10.53	12.84
Mean	12.74	13.69	13.56	13.33	12.49	14.17
M ₀	12.51	12.88	12.08	12.49		
M ₁	12.98	14.50	15.05	14.17		

S.E. of difference of two

1. D marginal means =0.74 ton/ac,
2. M marginal means =0.79 ton/ac.
3. V marginal means =0.59 ton/ac.
4. D means at the same level of M =1.21 ton/ac.
5. D means at the same level of V =1.11 ton/ac.
6. M means at the same level of V =1.04 ton/ac.
7. M means at the same level of D =1.36 ton/ac.
8. V means at the same level of D =1.02 ton/ac.
9. V means at the same level of M =0.84 ton/ac.

Crop :- Oats (*Rabi*).

Ref :- Pb. 49(42).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CMV'.

Object :- To study the response of early maturing varieties of Oats to sowing dates and application of manure.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) and (b) N.A. (c) Gidgee : 5.4 chh./plot ; IP-1 : 6 chh./plot Bunker : 4.8 chh./plot ; Weston-11:4.8 chh./plot ; I.P.H.3:6 chh./plot and Lyallpur-1 : 6.4 chh./plot. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 3.49". (x) 16.2.1950 to 31.3.1950.

2. TREATMENTS :

Main-plot treatments :

3 Dates of sowing : D₁=21.10.1949, D₂=11.11.1949 and D₃=2.12.1949.

Sub-plot treatments :

2 Manures : M₀=Control (No manure). M₁=A/S at 1 md./ac.

Sub-sub-plot treatments :

6 varieties : V₁=Bunker-10, V₂=Weston-11, V₃=I.P.H.3, V₄=I.P.-1, V₅=Gidgee-999 and V₆=Lyallpur-1 on 27.1.1950.

A/S applied on 1.1.1950 to D₁ plots, on 27.1.1950 to D₂ plots and on 2.8.1.1950 to D₃ plots.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 63'×71'-8". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) N.A. (iii) Forage yield. (iv) (a) Not continued. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 13.20 ton/ac.
 (ii) (a) 4.27 ton/ac.
 (b) 2.24 ton/ac.
 (c) 1.51 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of forage in ton/ac.

	V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	Mean	M ₀	M ₁
D ₁	13.83	14.02	12.73	14.49	13.00	13.60	13.61	12.49	14.74
D ₂	12.92	12.42	13.62	13.09	13.02	14.45	12.25	12.82	13.69
D ₃	14.08	13.07	13.21	12.15	11.70	12.09	12.72	12.80	12.64
Mean	13.61	13.17	13.19	13.25	12.57	13.38	13.20	12.70	13.69
M ₀	13.76	12.62	12.44	12.76	11.96	12.67	12.70		
M ₁	13.46	13.72	13.94	13.74	13.18	14.09	13.69		

S.E. of difference of two

1. D marginal means =1.23 ton/ac.
2. M marginal means =0.53 ton/ac.
3. V marginal means =0.62 ton/ac.
4. D means at the same level of M =0.84 ton/ac.
5. D means at the same level of V =1.57 ton/ac.
6. M means at the same level of V =0.96 ton/ac.
7. M means at the same level of D =0.92 ton/ac.
8. V means at the same level of M =0.87 ton/ac.
9. V means at the same level of D =1.07 ton/ac.

Crop :- Rape (*Rabi*).

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 49(37).

Type :- 'CMV'.

Object :- To study the response of Rape varieties to sowing time and manurial treatments.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
 (iv) (a) 1 *raja* plough, 3 *desi* plough and 4 *sohaga*. (b) N.A. (c) $\frac{1}{2}$ cht./plot, (d) and (e) N.A. (v) Nil.
 (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 2.57". (x) 3.12.1949 to 29.1.1950.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=23.9.1949, and D₂=13.10.1949, D₃=2.11.1949.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of manures : M₀=Control, M₁=15 ton/ac. F.Y M.

(2) 3 varieties : V₁=Japan rape, V₂=R.L. 18 and V₃=Local rape.

F.Y.M. applied on 12,13.9.1949.

3. DESIGN ;

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1/140 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19.54 ton/ac.
 (ii) (a) 5.557 ton/ac.
 (b) 1.434 ton/ac.
 (iii) Manures and variety effects are highly significant. Other effects are not significant.
 (iv) Av. yield of fodder in ton/ac.

	D ₁	D ₂	D ₃	Mean	M ₀	M ₁
V ₁	23.48	22.10	19.08	21.55	24.24	18.87
V ₂	21.17	19.03	17.61	19.27	22.44	16.10
V ₃	19.89	18.21	15.25	17.78	20.50	15.07
Mean	21.51	19.78	17.31	19.54		
M ₀	24.30	22.47	20.40	22.39		
M ₁	18.73	17.09	14.23	16.68		

S.E. of difference of two

1. D marginal means = 1.609 ton/ac.
 2. M marginal means = 0.338 ton/ac.
 3. V marginal means = 0.414 ton/ac.
 4. V means at a level of D = 0.717 ton/ac.
 5. D means at a level of V = 1.713 ton/ac.
 6. M means at a level of D = 0.585 ton/ac.
 7. D means at a level of M = 1.662 ton/ac.
- S.E. of body of M × V table = 0.414 ton/ac.

Crop :- Rape.

Ref :- Pb 50(30)

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CMV'.

Object :—To study the response of Rape varieties to sowing time and manurial treatments.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 0.21". (x) 25.11.1950 to 19.2.1951.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=22.9.1950, D₂=12.10.1950 and D₃=2.11.1950.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 2 levels of manures : M₀=Control and M₁=F.Y.M. at 10 ton/ac.

(2) 3 varieties : V₁=Japan, V₂=R.L. 18 and V₃=Local.

F.Y.M. applied on 20.9.1950, 10.10.1950 and 23.10.1950.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot. (a) N.A. (b) 1/180 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Germination good but growth is effected by severe cold and absence of rain. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1949 to 1950. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 11.26 ton/ac.
 (ii) (a) 2.05 ton/ac.
 (b) 1.216 ton/ac.
 (iii) Main-plots treatment effect is not significant. Manures and varieties effects are highly significant while two factor interactions are not significant.
 (iv) Av. yield of fodder in ton/ac.

	D ₁	D ₂	D ₃	Mean	M ₀	M ₁
V ₁	12.61	13.30	12.64	12.85	11.43	14.27
V ₂	10.62	12.19	10.72	11.18	10.13	12.22
V ₃	9.09	10.39	9.77	9.75	8.22	11.28
Mean	10.77	11.96	11.04	11.26		
M ₀	9.49	10.28	10.01	9.93		
M ₁	12.06	13.63	12.08	12.59		

S.E. of difference of two

1. D marginal means = 0.592 ton/ac.
 2. M marginal means = 0.351 ton/ac.
 3. V marginal means = 0.287 ton/ac.
 4. V means at a level of D = 0.608 ton/ac.
 5. D means at a level of V = 0.773 ton/ac.
 6. M means at a level of D = 0.497 ton/ac.
 7. D means at a level of M = 0.683 ton/ac.
- S.E. of body of M × V table = 0.351 ton/ac.

Crop :- Rape (*Rabi*).

Ref. :- Pb. 49(41).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CI'.

Object :- To study the response of Rape to spacings and irrigations.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 29.9.1949. (iv) (a) 1 *raja hal*, 6 *desi hal* and 8 *sohaga*. (b) N.A. (c) 8.75 *tola*/plot. (d) & (e) N.A. (v) 15 C.L. F.Y.M on 23,24,3.49. (vi) Japan Rape—(medium). (vii) Irrigated. (viii) Nil. (ix) 2.57" (x) N.A.

2. TREATMENTS:

Main-plot treatments:

3 levels of irrigation :- I₀=No irrigation, I₁=One irrigation and I₂=Two irrigations.

Sub-plot treatments:

4 spacings :- S₁=Broadcasting, S₂=Rows 1' apart, S₃=Rows 1½' apart and S₄=Rows 2' apart.

3. DESIGN:

(i) Split-plot, (ii) (a) 3 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) & (b) sub-plots 12' × 60.5'. (v) Nil. (vi) Yes.

4. GENERAL

(i) Good. No lodging. (ii) Attack of caterpillar ; dusting with Gammaxene. (iii) Seed yield/plot. (iv) (a) 19.9—1950. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Design in year 1950 changed to R.B.D Fact.

5. RESULTS :

- (i) 1512 lb./ac.
(ii) (a) 189.5 lb./ac.
(b) 133.5 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
I ₀	1601	1497	1504	1624	1557
I ₁	1524	1551	1497	1439	1503
I ₂	1504	1446	1365	1589	1476
Mean	1543	1498	1455	1551	1512

S.E. difference of two

1. I marginal means = 94.7 lb./ac.
2. S marginal means = 77.1 lb./ac.
3. S means at a level of I = 133.5 lb./ac.
4. I means at a level of S = 149.5 lb./ac.

Crop :- Rape (*Rabi*).

Ref. :- Pb. 50(25)

Site :- Fodder Res. Stn., Sirsa.

Type :- 'CP'.

Object :—To study the response of Rape to spacings and irrigations.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 9.10.50. (iv) (a) 1 *raja* plough, 4 *desi* plough and 6 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) Japan Rape. (vii) Irrigated. (viii) Nil. (ix) 0.21%. (x) 13.1.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of irrigations :— I₀=No irrigation, I₁=One irrigation and I₂=Two irrigations.(2) 4 spacings :—S₁=Broadcasting, S₂=Rows 1' apart, S₃=Rows 1½' apart and S₄=Rows 2' apart.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A.. (iii) 4. (iv) (a) 6'×63'. (b) 6'×60.5'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No Lodging. (ii) Nil. (iii) Seed yield. (iv) (a) 1949—1950. (b) No. (c) Nil. (v)(a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS :

- (i) 765.3 lb./ac.
(ii) 165.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

	S ₁	S ₂	S ₃	S ₄	Mean
I ₀	748.3	632.6	678.9	705.9	691.4
I ₁	825.4	860.1	732.9	771.4	797.5
I ₂	825.4	756.0	833.1	813.9	807.1
Mean	799.7	749.6	748.3	763.7	765.3

- S.E. of marginal mean of S = 47.81 lb./ac.
S.E. of marginal mean of I = 41.40 lb./ac.
S.E. of body of table = 82.81 lb./ac.

Crop :-Rape (Rabi).
Site :-Fodder Res. Stn., Sirsa.

Ref :-Pb. 49(40).
Type :-'CIV'.

Object : -To study the response of Rape varieties to agronomic factors such as time of sowing and irrigation.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) 1 *raja hal*, 3 *dest hal* and 4 *sohaga*. (b) N.A. (c) $\frac{1}{2}$ *chh.*/plot. (d) and (e) N.A. (v) 15 C.L. of F.Y.M. on 21.3.1949 and 23.3.1949. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) 2.57". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : $D_1=28.9.1949$, $D_2=19.10.1949$ and $D_3=11.11.1949$.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of irrigation : $I_0=$ No irrigation, $I_1=$ One irrigation and $I_2=$ Two irrigations.

(2) 3 varieties : $V_1=$ Local, $V_2=$ Japan rape and $V_3=R.L. 18$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) Sub-plot= $62' \times 7.3'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Attack of caterpillar ; dusting gammaxene. (iii) Seed yield. (iv) (a) 1949—1950. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) Nil. (vii) Experiment continued in year 1950 with split-split-plot design.

5. RESULTS :

(i) 1102 lb./ac.

(ii) (a) 429.0 lb./ac.

(b) 112.6 lb./ac.

(iii) Varieties effect is highly significant. Interaction main-plot \times sub-plot is highly significant while other effects are not significant.

(iv) Av. yield of seed in lb./ac.

	D_1	D_2	D_3	Mean	I_0	I_1	I_2
V_1	1046	1039	971	1019	1004	1015	1037
V_2	1153	1072	1013	1079	1079	1033	1126
V_3	1411	1318	899	1209	1149	1233	1246
Mean	1203	1143	961	1102			
I_0	1134	1147	951	1077			
I_1	1198	1161	922	1094			
I_2	1277	1122	1011	1136			

S.E. of difference of two

1. D marginal means = 143.0 lb./ac.
2. I or V marginal means = 37.5 lb./ac.
3. I or V means at a level of D = 64.8 lb./ac.
4. D means at a level of I or V = 152.5 lb./ac.
5. S.E. of body of D \times I table = 46.0 lb./ac.

Crop :- Rape (*Rabi*).
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 50(24).
Type :- 'CIV'.

Object :- To study the response of Rape varieties to times of sowing and irrigations.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments.
(iv) (a) 1 *raja*, 4 *desi* and 6 *sohaga*. (b) N.A. (c) Japan Rape 10/29 *chh./plot*. (d) and (e) N.A. (v)
N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 0.21". (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 date of sowing : $D_1=28.9.1950$, $D_2=19.10.1950$ and $D_3=10.11.1950$.

Sub-plot treatments :

3 levels of irrigation : I_0 =No irrigation, I_1 =One irrigation and I_2 =Two irrigations.

Sub-sub-plot treatments :

3 varieties : V_1 =Local, V_2 =Japan rape and V_3 =*Raya L 18*.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4.
(iv) (a) and (b) Sub-sub-plot= $4' \times 60.5'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Seed yield. (iv) (a) 1949--1950. (b) No. (c) Nil. (v) (a) No.
(b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 935.1 lb./ac.
(ii) (a) 461.7 lb./ac.
(b) 229.3 lb./ac.
(c) 222.5 lb./ac
(iii) Varieties effect is highly significant, sub-plots effect and interaction main-plot \times sub-plot is significant while all others are not significant.
(iv) Av. yield of seed in lb./ac.

	I_0	I_1	I_2	Mean	V_1	V_2	V_3
D_1	717.4	815.8	1058.8	864.0	860.1	811.9	919.9
D_2	939.2	1178.4	1031.8	1049.8	985.5	958.5	1205.4
D_3	883.3	833.1	958.5	891.6	810.1	819.6	1045.3
Mean	846.6	942.4	1016.4	935.1			
V_1	838.9	838.9	977.8	885.2			
V_2	783.0	842.8	964.3	863.4			
V_3	918.0	1145.6	1107.0	1056.9			

S.E. of difference of two

1. D marginal means = 108.9 lb./ac.
2. I marginal means = 54.0 lb./ac.
3. V marginal means = 52.5 lb./ac.
4. V means at a level of I = 90.9 lb./ac.
5. I means at a level of V = 91.8 lb./ac.
6. V means at a level of D = 90.9 lb./ac.
7. D means at a level of V = 131.7 lb./ac.
8. I means at a level of D = 93.6 lb./ac.
9. D means at a level of I = 133.0 lb./ac.

Crop :- *Senji (Rabi)*.

Ref :- Pb. 51 (71).

Site :- Govt. Agri. Stn., Gurdaspur.

Type :- 'M'.

Object :—To study the residual effect of manures applied to the previous Maize crop on the following *Senji* crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) As under treatments. (ii) (a) Loam. (b) N.A. (iii) 20.10.1951. (iv) (a) 1 *raja* plough, 4 *desi* and 6 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) 7.03". (x) 9, 19.2.1952.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 3 sources of N : $S_1=A/S$, $S_2=$ Ammo. Phos. and $S_3=F.Y.M.$

(2) 3 levels of N : $N_1=50$, $N_2=75$ and $N_3=100$ lb./ac.

Manures applied to previous maize crop.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) $22' \times 60.5'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESNLTS :

(i) 26615 lb./ac.

(ii) 2462.8 lb./ac.

(iii) Control vs others and sources of N effect are highly significant while levels of N is significant. Interaction source \times level is not significant.

(iv) Av. yield of forage in lb./ac.

Control = 24233 lb./ac.

	N_1	N_2	N_3	Mean
S_1	24747	23575	27319	25214
S_2	26311	27627	28800	27579
S_3	26414	28697	28430	27847
Mean	25824	26633	28183	26880

S.E. of any marginal mean = 580.5 lb./ac.
S.E. of body of table = 1005.5 lb./ac.

Crop :- *Senji*.

Ref :- Pb. 52 (31).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'M'.

Object :—To study the behaviour of *Senji* crop to the application of N and P_2O_5 alone and in combination in different proportions.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium to heavy loam. (b) Refer soil analysis, Sirsa. (iii) 23.10.1952. (iv) (a) 3 *desi hal* and 2 *sohaga*. (b) Broadcast. (c) 4 *chk./plot*. (d) and (e)—. (v) Nil. (vi) FOS I (medium). (vii) Irrigated. (viii) 3 weedings [and hoeings. (ix) 0.89". (x) 14.2.1953 to 3.3.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : $N_0=0$, $N_1=50$ and $N_2=100$ lb./ac. of N.

(2) 4 levels of P_2O_5 : $P_0=0$, $P_1=50$, $P_2=100$ and $P_3=150$ lb./ac. of P_2O_5 .

A/S and Super applied before sowing on 23.10.1952 by broadcast.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 8.5'×64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1952 to 1954. (b) No. (c) Nil. (v) (a) No (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.30 ton/ac.
 (ii) 1.574 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of fodder in ton/ac.

	P ₀	P ₁	P ₂	P ₃	Mean
N ₀	15.04	17.67	17.56	17.04	16.83
N ₁	17.28	18.20	16.95	18.03	17.62
N ₂	16.42	17.11	18.25	18.07	17.46
Mean	16.25	17.66	17.59	17.71	17.30

S.E. of marginal mean of N = 0.393 ton/ac.
 S.E. of marginal mean of P₂O₅ = 0.454 ton/ac.
 S.E. of body of table = 0.787 ton/ac.

Crop :- *Senji*.

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 53(60).

Type :- 'M'.

Object :- To study the behaviour of *Senji* crop to the application of N and P₂O₅ alone and in combination.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 23.10.1953. (iv) (a) 1 *raja* plough, 2 *desi* plough and 1 horse hoe. (b) Broadcast. (c) 4 chk./plot. (d) and (e)—. (v) Nil. (vi) FOS I (medium). (vii) Irrigated. (viii) 3 weedings and hoeings. (ix) 4.71". (x) 28.1.1954, 29.1.1954, 30.1.1954, 31.1.1954, 3.2.1954, 12.2.1954 and 4.2.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 levels of N : N₀=0, N₁=50 and N₂=100 lb./ac.

(2) 4 levels of P₂O₅ : P₀=0, P₁=50, P₂=100 and P₃=150 lb./ac. of P₂O₅.

P₂O₅ applied as Super on 13.10.1953. Half dose of N as A/S was applied on 13.10.1953 and the remaining half dose on 27.12.1953 by broadcast.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 10'-6"×64'. (b) 8'-8"×63'. (v) 8" and 6" left as border on length and breadth side of each plot. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 11.46 ton/ac.
 (ii) 1.11 ton/ac.
 (iii) None of the effects is significant.

(iv) Av. yield of fodder in ton/ac.

	P ₀	P ₁	P ₂	P ₃	Mean
N ₀	10.04	11.36	11.52	11.43	11.09
N ₁	11.41	12.18	11.03	11.15	11.44
N ₂	11.89	11.41	11.83	12.29	11.86
Mean	11.11	11.65	11.46	11.62	11.46

S.E. of marginal mean of N = 0.28 ton/ac.

S.E. of marginal mean of P = 0.32 ton/ac.

S.E. of body of table = 0.56 ton/ac.

Crop :- Kudzu Vine.

Ref :- Pb. 52(35).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'C'.

Object :—To study the influence of cutting the grass at varying intervals after taking uniform cuttings on 5.7.1952.

1. BASAL CONDITIONS :

(i) Sown on 12.3.1950 from 200 root stock. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) Root stock. (iv) *Peuraria thumbergiana*. (v) Planting on 12.3.1950. (vi) Cuttings were taken. (vii) Nil. (viii) N.A. (ix) No. (x) Irrigated. (xi) 9.21". (xii) 10.8.1952, 23.8.1952, 13.9.1952, 11.10.1952, 18.10.1952, 22.11.52 and 29.11.1952.

2. TREATMENTS :

Cutting intervals :—

1. Cutting after 35 days interval.
2. Cutting after 49 days interval.
3. Cutting after 63 days interval.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) 1/433 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Forage yield. (iv) (a) 1952-53. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. — RESULTS :

(i) 12.86 ton/ac.

(ii) 1.80 ton/ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	14.66
2.	12.58
3.	11.34
S.E./mean	= 0.90 ton/ac.

Crop :- Kudzu Vine.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 53(63)
Type :- 'C'.

Object :- To study the influence of cutting the grass at varying intervals after taking a uniform cutting on 2.4.1953.

1. BASAL CONDITIONS :

(i) Sown on 12.3.1950 from 200 root stock. (ii) (a) Loamy medium. (b) Refer soil analysis, Sirsa. (iii) Root stock. (iv) Kudzu Vine. (v) 12.3.1950 ; planting root stock. (vi) Only root stock were taken. (vii) Nil. (viii) 3 weedings before start of the expt. (ix) Nil. (x) Irrigated. (xi) 18.17". (xii) Uniform cutting on 2.4.1953 and the expt. started. Cutting intervals 35 days ; 2.4.1953, 7.5.1953, 11.6.1953, 24.7.1953, and 1.9.1953, cutting interval 49 days ; 2.4.1953, 21.5.1953, 24.7.1953 and 1.9.1953, cutting interval 63 days ; 2.4.1953, 5.6.1953 and 1.9.1953.

2. TREATMENTS :

3 intervals of cutting

1. 35 days.
2. 49 days.
3. 63 days.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) 10' x 10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. (ii) No. (iii) Yield of fodder. (iv) (a) 1952-1953. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14.57 ton/ac.
- (ii) 3.20 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	12.98
2.	15.28
3.	15.45
S.E./mean	= 1.60 ton/ac.

Crop :- Para Grass.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 53(62).
Type :- 'C'.

Object :- To study the influence of cutting the grass at varying intervals after taking a uniform cutting on 18.5.53.

1. BASAL CONDITIONS :

(i) Cowpeas grown without manure in this area and for the next season field was kept fallow and the crop was planted. (ii) (a) Medium loamy. (b) Refer soil analysis, Sirsa. (iii) By planting cuttings. (iv) Para grass (*Panicum purpura scens*). (v) Planted cuttings on 4.3.1953. (vi) Nil. (vii) Nil. (viii) Occasional weedings. (ix) Nil. (x) Irrigated. (xi) 18.17". (xii) Cuttings on 18.5.1953, 18.6.1953, 16.7.1953, 14.8.1953, 18.5.1953, 25.6.1953, 2.8.1953, 8.9.1953 and 18.5.1953, 2.7.1953, 17.8.1953 and 29.9.1953 for the three intervals.

2. TREATMENTS :

Three intervals of cutting.

1. 4 weeks.
2. 5 weeks.
3. 6 weeks

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) 9' x 15'. (v) No. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Length of shoots and forage yield. (iv) (a) No. (b) No. (v) N.A. (vi) Nil. (vii) N.A.

5. RESULTS :

- (i) 16.08 ton/ac.
- (ii) 1.93 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	16.66
2.	14.27
3.	17.31
S.E./mean	= 1.12 ton/ac.

Crop :- Tea.

Ref :- Pb. 53(17).

Site :- Govt. Tea Farm, Palampur (Kangra).

Type :- 'M'.

Object :—To study the optimum dose of A/S and Super for Tea.

1. BASAL CONDITIONS :

- (i) This area was under tea crop which was given 3 hoeings in a year and 160 lb. of A/S applied yearly.
- (ii) (a) Red clay. (b) N.A. (iii) Transplanting. (iv) China. (v) Planted during the year 1880 at a distance of 5' each way. (vi) 2 years. (vii) No. (viii) 3 hoeings. (ix) No crop sown. (xi) 88.18".
- (xii) 12.4.1953, 28.29.5.1953, 17.7.1953, 14.8.1953, 5.9.1953, and 13.10.1953.

2. TREATMENTS :

- 1. 40 lb./ac. of N as A/S applied in March.
- 2. 80 lb./ac. of N as A/S in March.
- 3. 120 lb./ac. of N as A/S+50 lb./ac. of P₂O₅ as Super in March.
- 4. 40 lb./ac. of N in March+40 lb./ac. of N in June as A/S.
- 5. 50 lb./ac. of P₂O₅ as Super in March.
- 6. 60 lb./ac. of N in March+60 lb./ac. of N in June as A/S.
- 7. Control.

3. DESIGN :

- (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) 30 bushes. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Nil. (iv) (a) 1952-continued. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2603 lb./ac.
- (ii) 473.1 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of tea in lb./ac.

Treatment	Av. yield
1.	2526
2.	2693
3.	3095
4.	2943
5.	2982
6.	1998
7.	1982
S.E./mean	= 193.1 lb./ac.

Crop :- Tea.
Site :- Govt. Tea Farm, Palampur.

Ref :- Pb. 53(18).
Type :- 'C'.

Object :—To find out the best time of pruning Tea.

1. BASAL CONDITIONS :

(i) This area was under tea crop which was given 3 hoeings in a year and 160 lbs. of A/S was applied yearly. (ii) (a) Red clay. (b) N.A. (iii) Transplanted. (iv) China. (v) Planted in 1880 at a distance of 5' each way. (vi) 2 years. (vii) Nil. (viii) 3 hoeings in a year. (ix) No crop is sown in the bushes. (x) Unirrigated. (xi) 88.18°. (xii) 21.4.1953, 25.7.1953, 13.8.1953, 3.9.1953 and 8.10.1953.

2. TREATMENTS :

Dates of pruning.

1. 1st November.
2. 22nd November.
3. 15th February.
4. 2nd June.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) 30 bushes. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Nil. (iv) (a) 1952-continued. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2052 lb./ac.
- (ii) 480.7 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of tea in lb./ac.

Treatment	Av. yield
1.	2003
2.	1900
3.	2294
4.	2012
S.E./mean=	196.3 lb./ac.

Crop :- Tea.
Site :- Govt. Tea Farm, Palampur.

Ref :- Pb. 53(16).
Type :- 'CM'.

Object :—To find out the optimum dose of A/S and best interval for pruning and plucking Tea.

1. BASAL CONDITIONS :

(i) This area was under the crop which was given three hoeings in a year and 160 lb. of A/S was applied yearly. (ii) (a) Red clay. (b) N.A. (iii) Transplanting. (iv) China. (v) Planted during the year 1880 at a distance of 5' each way. (vi) Two years. (vii) No. (viii) 3 hoeings. (ix) No crops sown. (x) Unirrigated. (xi) 88.18°. (xii) 14.4.1953, 8.5.1953, 17.7.1953, 18.8.1953, 9.9.1953 and 14.10.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N : $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac.
- (2) 3 intervals of plucking : Pl_1 =weekly, Pl_2 =fort nightly and Pl_3 =monthly,
- (3) 3 intervals of pruning : Pr_1 =after 1 year, Pr_2 =after 2 years and Pr_3 =after 3 years.

3. DESIGN :

(i) 3^3 Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) 30 bushes. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Nil. (iv) (a) 1951—continued. (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2858 lb./ac.
(ii) 740.0 lb./ac.
(iii) Main effect of N is highly significant. Interaction N×P1 is also significant.
(iv) Av. yield of tea in lb./ac.

	Pl ₁	Pl ₂	Pl ₃	Mean	Pr ₁	Pr ₂	Pr ₃
N ₁	2393	2575	1987	2318	2502	2161	2292
N ₂	2980	2431	2604	2671	2491	2732	2791
N ₃	3177	3695	3884	3585	3382	3479	3895
Mean	2850	2900	2825	2858			
Pr ₁	2845	2835	2695	2792			
Pr ₂	2688	2860	2824	2791			
Pr ₃	3016	3006	2956	2993			

S.E. of any marginal mean = 123.3 lb./ac.
S.E. of body of table = 213.6 lb./ac.

Crop :- Gram.

Site :- Govt. Agri. Stn., Hansi.

Ref :- Pb. 52(107).

Type :- 'X'.

Object :- To study the effect of mixed cropping on yield of Gram.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) *Guara*. (c) *Guara* green manured on 28.8.1952 by ploughing the field. (ii) (a) Loam. (b) N.A. (iii) 12.10.1952. (iv) (a) 3 *dest* plough, 4 *sohaga* and 2 roller. (b) N.A. (c) 15 seer gram+7½ seer Barley/ac.; 15 seer gram+7½ seer wheat/ac.; 22½ seer gram/ac. (d) and (e) N.A. (v) Nil. (vi) Gram : Punjab. 7 (medium) ; Wheat : C-591 (medium) and Barley : T-4 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.86". (x) 23,24.3.1952.

2. TREATMENTS :

1. Gram alone.
2. Gram+Barley.
3. Gram+Wheat.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 54'-5"×10'. (b) 54'-5"×10'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to satisfactory. No lodging. (ii) Some plots effected by *Thangi*, control measure Nil. (iii) Grain yield/plot. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1079 lb./ac.
(ii) 361.7 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	949
2.	1372
3.	916
S.E /mean	=147.7 lb./ac.

Crop :- Soyabean and Maize (*Kharif*).

Ref. :- Pb. 50(6)

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'X'.

Object :—To study the suitability of sowing Soyabean and Maize in mixture to get maximum yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 25.5.1950. (iv) (a) 5 ploughings, and 4 *sohaga*. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 78.13". (x) Maize 24.9.50, Soyabean 15.10.1950.

2. TREATMENTS :

1. Soyabean.
2. Maize and Soyabean.
3. Maize alone.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 18'×60'. (b) 18'×60'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS :

- (i) 1394 lb./ac.
- (ii) 216.7 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1103
2.	1960
3.	1120
S.E./mean	= 108.4 lb./ac.

Crop :- Maize (*Kharif*).

Ref. :- Pb. 51(67).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan.

Type :- 'X'.

Object :—To study if sowing of Soyabean in Maize effects the yield of Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Linseed. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 20.5.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) 78.13". (x) 23.9.51.

2. TREATMENTS :

1. Maize sown alone.
2. Maize sown with Soyabean.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) 16'×12'. (b) 16'×12'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Below normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1952. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS :

- (i) 1097 lb./ac.
- (ii) 64.8 lb./ac.
- (iii) Treatments are significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1019
2.	1175
S.E./mean	= 32.4 lb./ac.

Crop :- Maize.

Ref :- Pb. 52(138).

Site :- Linseed Breeding Sub-Stn., Nagrota Bagwan. Type :- 'X'.

Object :- To study if sowing of Soyabean in Maize effects the yield of Maize.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 18.5.1952. (iv) (a) 4 ploughings and 4 *sohaga*. (b) to (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) 64.21". (x) Maize 20.9.1952.

2. TREATMENTS :

1. Maize sown alone.
2. Maize sown with Soyabean.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 9'x40'-4". (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Yield/plot. (iv) (a) 1951-52. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1268 lb./ac.
 (ii) 38.3 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of maize in lb /ac.

Treatment	Av. yield
1.	1196
2.	1340
S.E./mean	= 15.6 lb./ac.

Crop :- Colocasia.

Ref :- Pb. 52(146).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'X'.

Object :- To study the effect on yield of Colocasia, when sown alone and intercropped with Bitter Gourd.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Loam with *kaller* patch. (b) Refer soil analysis, Jullundur. (iii) 6.3.1952. (iv) (a) 5 *desi* ploughings and 3 *sohaga*. (b) to (e) N.A. (v) 10 ton/ac. of F.Y.M. was given before sowing. (vi) Local. (vii) Irrigated. (viii) 6 hoeings and 1 earthing. A/S was applied at 100 lb /ac. on 26 4.1952. The crop was sprayed with Perinox. (ix) 29.86". (x) 24,25.9.1952.

2. TREATMENTS :

1. Crop sown alone.
2. Intercropped with bitter gourd.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12'x30'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of colocasia. (iv) (a) No. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 14453 lb./ac.
 (ii) 640.6 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
1.	14904
2.	14001
S.E./mean	= 320.3 lb./ac.

Crop :- Colocasia.

Ref :- Pb. 53 (224).

Site :- Jullundur Agri. Stn., Jullundur.

Type :- 'X'.

Object :—To investigate whether intercropping of Colocasia is economical if sown with Long melon or Bitter gourd or it should be sown alone.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sweet potato. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii) 12.2.1953. (iv) (a) 1 *raja* plough, 3 *desi* plough and 3 *sohaga*. (b) to (e) N.A. (v) Basal dose of compost was given at 8 ton/ac. (vi) Local. (vii) Irrigated. (viii) 4 hocings and one earthing up. (ix) 25.73°. (x) 22.9.1953.

2. TREATMENTS :

1. Colocasia sown alone.
2. Colocasia intercropped with bitter gourd.
3. Colocasia intercropped with long melon.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/220th ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Condition of crop remained below normal due to high temperature, hot winds and short supply of water during May and June at the advanced stage of growth the crop was attacked by disease. (ii) At the advanced stage of growth the crops were attacked by mycological disease called, *photophthora colocasia* Rea and seriously affected the yield. (iii) Yield/plot. (iv) (a) 1953—contd. (b) No (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 23715 lb./ac.
 (ii) 1108.2 lb./ac.
 (iii) The treatments are not significantly different.
 (iv) Av. yield of colocasia in lb./ac.

Treatment	Av. yield
1.	24099
2.	24416
3.	22629
S.E./mean	= 554.1 lb./ac.

Crop :- Oats (*Rabi*).

Ref :- Pb. 48 (48).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'X'.

Object :—To compare the forage yielding capacity of Oats when sown alone and in mixture with peas and field peas.

1. BASAL CONDITIONS :

(i) (a) No. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 28.10.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) Oats, local. (vii) Irrigated. (viii) Nil. (ix) 0.90°. (x) N.A.

2. TREATMENTS :

1. Oats.
2. Peas.
3. Field peas.
4. Oats+peas.
5. Oats+field peas.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to good. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 17.44 ton/ac.
- (ii) 2.51 ton/ac.
- (iii) Treatment effects are highly significant.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	22.69
2.	15.28
3.	9.10
4.	20.49
5.	19.64
S.E./mean	= 1.03 ton/ac.

Crop :- Berseem.

Ref :- 48(47).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'X'.

Object :—To study the influence of intercropping Rape with Berseem to augment fodder yield.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) Refer soil analysis, Sirsa. (iii) 29.10.1948. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 0.90°. (x) 1st cut ; 1.1.1949 to 11.1.1949, subsequent cutting on ; 16.2.1949, 23.3.1949 and 20.4.1949.

2. TREATMENTS :

- 1. 8 sr./ac. of berseem+2 chks. rape.
- 2. 8 sr./ac. of berseem+4 chks. rape.
- 3. 8 sr./ac. of berseem+6 chks. rape.
- 4. 8 sr./ac. of berseem+8 chks. rape.
- 5. Berseem alone.

3 DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/36 th ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1948—1949. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 25.61 ton/ac.
- (ii) 2.09 ton/ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	25.35
2.	25.76
3.	27.13
4.	27.50
5.	22.33
S.E./mean	= 0.85 ton/ac.

Crop :- Berseem (*Rabi*).
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 49(39).
Type :- 'X'.

Object :- To study the effect of intercropping Rape with Berseem on its forage yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) 26.9.1949. (iv) (a) 1 *raja*, 3 *desi hal* and 4 *sohaga*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 16 C.L. of F.Y.M. on 19/20.8.1949. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 3.49°. (x) 26.11.1949 to 28.3.1950.

2. TREATMENTS :

1. Berseem + 2 chks. rape seed.
 2. Berseem + 4 chks. rape seed.
 3. Berseem + 6 chks. rape seed.
 4. Berseem + 8 chks. rape seed.
 5. Berseem alone.
- 8 sr./ac. of Berseem used in all plots.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 9.45' x 128'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good growth. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) 1948-1949. (b) No. (c) Nil. (v) (a) Nil. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 39.05 ton/ac.
- (ii) 3.42 ton/ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	38.44
2.	40.22
3.	40.75
4.	40.03
5.	35.79
S.E./mean	= 1.39 ton/ac.

Crop :- *Metha* and Oats.
Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 53(58).
Type :- 'X'.

Object :- To study the effect on the yield of Oats when sown alone or in combinations with *Metha*.

1. BASAL CONDITIONS :

(i) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy heavy to medium. (b) Refer soil analysis, Sirsa. (iii) 29.10.1953. (iv) (a) 2 *desi* plough and 1 planking. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) *Metha* No. 8 (medium) and Oats Weston 11 (medium). (vii) Irrigated. (viii) 3 hoeings and weeding. (ix) 4.71°. (x) 2.3.1954 to 15.3.1954.

2. TREATMENTS :

- Seed rate mixture/ac.
1. 25 sr./ac. of oats.
 2. 20 sr./ac. of oats + 5 sr. of *metha*.
 3. 15 sr./ac. of oats + 10 sr. of *metha*.
- Sown by broadcast.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) and (b) 7' x 64'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Oats crop grew luxuriantly and *metha* plants were almost reduced to single shoots. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) and (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 21.24 ton/ac.
 (ii) 1.71 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of forage in ton/ac.

Treatment	Av. yield
1.	21.53
2.	21.02
3.	21.16
S.E /mean	=0.61 ton/ac.

Crop :- Maize and Cowpeas (*Kharif*).

Ref :- Pb. 50(27).

Site :- Fodder Res. Stn. Sirsa.

Type :- 'X'.

Object :- To study the effect of seed rate and time of sowing Maize and Cowpeas with a view to obtain maximum forage yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) 1 *raja*, 5 *desi* ploughing and 7 *sohaga*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 12 C.L./ac. F.Y.M. applied before sowing. (vi) Local (medium). (vii) Irrigated. (viii) Nil. (ix) 7.33". (x) 1.6.1950 to 11.6.1950 and 3.8.1950 to 15.8.1950.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : $D_1=25.3.1950$ and $D_2=31.5.1950$.

Sub-plot treatments :

4 seed rates : $S_1=16$ sr./ac. of maize, $S_2=14$ sr./ac. of maize+2 sr./ac of cowpeas, $S_3=12$ sr./ac. of maize+4 sr./ac. of cow peas and $S_4=10$ sr.ac. of maize+6 sr./ac. of cow peas.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block and 4 sub-plot/main-plots. (iii) 4. (iv) (a) Sub-plot. 62.5'×11.3'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Forage yield/plot. (iv) (a) 1950-1951. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 8.98 ton/ac.
 (ii) (a) 5.31 ton/ac.
 — (b) 1.11 ton/ac.
 (iii) Dates of sowing effect is significant, while seed rate effect and interaction "dates of sowing×seed rate" are not significant.
 (iv) Av. yield of forage in ton/ac.

	S_1	S_2	S_3	S_4	Mean
D_1	4.76	5.55	5.80	5.69	5.45
D_2	13.63	12.25	12.03	12.16	12.52
Mean	9.20	8.90	8.92	8.92	8.98

S.E. of difference of two

1. D marginal means =1.88 ton/ac.
 2. S marginal means =0.55 ton/ac.
 3. S means at the same level of D =0.79 ton/ac.
 4. D means at the same level of S =2.00 ton/ac.

Crop :-Maize and Cowpeas (*Kharif*).

Ref :-Pb. 51(103).

Site :-Fodder Res. Stn., Sirsa.

Type :-'X'.

Object :—To study the effect of seed rate and time of sowing on mixture of Maize and Cowpeas with a view to obtain maximum forage yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 5.48". (x) 2 to 5.7.1951 and 9-11.1.1951.

2. TREATMENTS

Main-plot treatments :

2 dates of sowing: $D_1=27.4.1951$ and $D_2=8.6.1951$.

Sub-plot treatments :

4 seed rates: $S_1=16$ sr./ac. of maize, $S_2=14$ sr./ac. of maize+2 sr./ac. of cowpeas, $S_3=12$ sr./ac. of maize+4 sr./ac. of cowpeas and $S_4=10$ sr./ac. of maize+6 sr./ac. of cowpeas.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 60.5'×9'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Very poor. No lodging. (ii) Nil. (iii) Green forage yield. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 24.57 ton/ac.
 (ii) (a) 1.58 ton/ac.
 (b) 0.71 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of forage in ton/ac.

	S_1	S_2	S_3	S_4	Mean
D_1	31.41	32.51	21.86	22.96	27.18
D_2	23.33	23.51	20.94	20.02	21.95
Mean	27.37	28.01	21.40	21.49	24.57

S.E. of difference of two

1. D marginal means =0.55 ton/ac.
 2. S marginal means =0.35 ton/ac.
 3. S means at a level of D =0.55 ton/ac.
 4. D means at a level of S =0.71 ton/ac.

Crop :- *Jowar* and *Guara*.

Ref :- Pb. 51(96).

Site :- Fodder Res. Stn., Sirsa.

Type :- 'X'.

Object :—To establish the best sowing date and seed rate for *Jowar* and *Guara* for forage yield.

1. BASAL CONDITIONS .

(i) (a) Nil. (b) Berseem. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) 1 *raja*, 4 *desi* plough and 6 *sohaga*. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) *Jowar* J-520, (medium) *guara*-local- (medium), (vii) Irrigated. (viii) Nil. (ix) 5.48". (x) 10,27.7.1961. and 12,28.8.1951.

2. TREATMENTS :

Main-plot treatments :

2 dates of sowing : $D_1=26.4.1951$ and $D_2=7.6.1951$.

Sub-plot treatments :

4 seed rates : $S_1=20$ sr./ac. of *Jowar*, $S_2=16$ sr./ac. of *Jowar*+4 sr./ac. of *Guara*, $S_3=14$ sr./ac. of *Jowar*+6 sr./ac. of *Guara* and $S_4=12$ sr./ac. of *Jowar*+8 sr./ac. of *Guara*.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 60.5'×9' (v) Nil. (vi) Yes.

4. GENERAL :

(i) Satisfactory. (ii) Nil. (iii) Forage yield/plot. (iv) (a) No. (b)—. (c)—. (v) (a) Nil. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 23.22 ton/ac.

(ii) (a) 4.27 ton/ac.

(b) 1.24 ton/ac.

(iii) Dates of sowing and seed rate effects are highly significant while interaction is significant.

(iv) Av. yield of forage in ton/ac.

	S_1	S_2	S_3	S_4	Mean
D_1	17.17	19.42	20.68	19.90	19.29
D_2	27.53	28.68	26.47	25.87	27.14
Mean	22.35	24.05	23.58	22.89	23.22

S.E. of difference of two

1. D marginal means =1.23 ton/ac.
2. S marginal means =0.51 ton/ac.
3. S means at a level of D =0.71 ton/ac.
4. D means at a level of S =1.38 ton/ac.

Crop :- *Chari* and *Guara* (*Kharif*).

Site :- Fodder Res. Stn., Sirsa.

Ref :- Pb. 50(28).

Type :- 'X'.

Object :—To study the optimum seed rate of *Chari* and *Guara* to get maximum forage yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Sirsa. (iii) As per treatments. (iv) (a) 1 *raja*, 4 *desi* ploughing and 5 *sohaga*. (b) to (e) N.A. (v) 12 C.L./ac. of F.Y.M. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 7.12". (x) 15.7.1950 and 2.8.1950.

2. TREATMENTS

Main-plot treatments :

2 dates of sowing : $D_1=14.4.1950$ and $D_2=12.6.1950$.

Sub-plot treatments :

4 seedrates : $S_1=20$ sr./ac. of *Chari*+2 sr./ac. of *Guara*, $S_2=16$ sr./ac. of *Chari*+4 sr./ac. of *Guara*, $S_3=14$ sr./ac. of *Chari*+6 sr./ac. of *Guara* and $S_4=12$ sr./ac. of *Chari*+8 sr./ac. of *Guara*.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) Sub-plot. (a) and (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Satisfactory. No lodging. (ii) Nil. (iii) Forage yield. (iv) (a) No. (b) —. (c) —. (v) (a) No. (b) —. (vi) Nil.

5. RESULTS :

- (i) 23.12 ton/ac.
 (ii) (a) 11.21 ton/ac.
 (b) 4.44 ton/ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of forage in ton/ac.

	S ₁	S ₂	S ₃	S ₄	Mean
D ₁	21.88	21.32	21.53	20.20	21.23
D ₂	24.24	25.18	25.73	24.80	25.00
Mean	23.06	23.25	23.63	22.50	23.12

S.E. of difference of two

1. D marginal means = 3.97 ton/ac.
2. S marginal means = 2.22 ton/ac.
3. S means at a level of D = 3.14 ton/ac.
4. D means at a level of S = 3.28 ton/ac.

HIMACHAL PRADESH

Crop :- Wheat (*Rabi*).

Ref :- H.P. 53(172).

Site :- Seed Multiplication-cum-Demonstration Farm, Bhangrotu. Type :- 'M'.

Object :—To find out the effect of different treatments of artificial fertilizers on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy. (b) N.A. (iii) 27.10.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Ridly (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 14.68". (x) 3.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=20$ lb./ac.

Treatments applied before sowing in dry seed beds.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22' x 6'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tillering, germination, stand percentage and grain yield/plot. (iv) (a) Not continued. (b) and (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 3060 lb./ac.

(ii) 342.4 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	Mean
P_0	3076	3161	3119
P_1	3087	2917	3002
Mean	3082	3039	3060

S.E. of any marginal mean = 121.1 lb./ac.

S.E. of body of table = 171.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- H.P. 51(121).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :—To study the effect of N, P_2O_5 and K_2O alone and in combination on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Loamy to clayey. (b) N.A. (iii) 13,14.10.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) N,P-770 (medium). (vii) Unirrigated. (viii) Nil. (ix) 9.01". (x) 7.7.1952.

2. TREATMENTS :

All combinations of (1) (2), and (3)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=40$ lb./ac.

(2) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=40$ lb./ac.

(3) 2 levels of K_2O as Pot. Sul. : $K_0=0$ and $K_1=20$ lb./ac.

N and K_2O applied on 15.3.1952 before earing. P_2O_5 applied with surface soil before sowing.

3. DESIGN :

(i) 2³ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 12'×46'. (b) 6'×40'. (v) 3' around. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Germination and stand %, population count, tillering, height, straw and grain yield/plot. (iv) (a) Not continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1041 lb./ac.
 (ii) 227.3 lb./ac.
 (iii) Only main effect of P is highly significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	Mean	K ₀	K ₁
N ₀	709	1310	1010	970	1049
N ₁	760	1384	1072	1100	1044
Mean	735	1347	1041		
K ₀	720	1350	1035		
K ₁	749	1344	1047		

S.E. of any marginal mean = 56.8 lb./ac.

S.E. of body of table = 80.4 lb./ac.

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Arki-Solan (H.P.).

Type :- 'M'.

Object :- I (a) (ii), To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Sandy to clayey-pH. 7.2. (iii) Nil. (iv) (a) to (e) N.A. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) April-May.

2. TREATMENTS :

O = Control.

N₁ = A/S at 20 lb./ac. of N.

N₂ = A/S at 40 lb./ac. of N.

N₁^u = Urea at 20 lb./ac. of N.

N₂^u = Urea at 40 lb./ac. of N.

Fertilizers broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953-56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
O	1008
N ₁	1074
N ₂	1126
N ₁ ^r	1232
N ₂ ^r	1156
G.M.	1119
S.E./mean	57.84 lb./ac.
No. of experiments	8

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Arki-Solan (H.P.).

Type :- 'M'.

Object :- I (a) (ii), To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Sandy to clayey-pH. 7.2. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) April-May.

2. TREATMENTS :

O = Control.
 N₁ = A/S at 20 lb./ac.
 N₂ = A/S at 40 lb./ac.
 N₁^r = Urea at 20 lb./ac. of N.
 N₂^r = Urea at 40 lb./ac. of N.
 Fertilizers broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953-56. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
O	378
N ₁	405
N ₂	480
N ₁ ^r	389
N ₂ ^r	394
G.M.	409
S.E./mean	36.04 lb./ac.
No. of expts.	5

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M), 1953.

Centre :- Arki-Solan(H.P).

Type :- 'M'.

Object :—II, To study the effect of manures (N,P and K).

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Sandy to clayey-pH. 7.2. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) April-May.

2. TREATMENTS :

O =Control.

N =A/S at 20 lb./ac. of N.

NP =A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

N'P =A/N at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

N"P =Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

Fertilizers broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
O	569
N	706
NP	682
N'P	639
N"P	689
G.M.	657
S.E./mean	34.89 lb./ac.
No. of expts.	3

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Arki-Solan (H.P.)

Type :- 'M'.

Object :—II, To study the effect of manures (N,P and K).

1. BASAL CONDITIONS :

(i) (a) N.A. (b) N.A. (c) N.A. (ii) Sandy to clayey-pH. 7.2. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) April-May.

2. TREATMENTS :

O =Control.

N₁ =A/S at 20 lb./ac. of N.

N₁P =A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

N₁" =Urea 20 lb./ac. of N.

N₁"P =Urea at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.

Fertilizers broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatment	Av. yield in lb./ac.
O	903
N ₁	1065
N ₂ P	1066
N ₁ '	1065
N ₁ 'P	1278
G.M.	1075
S.E./mean	=108.4 lb./ac.
No. of expts.	4

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :- Arki-Solan (H.P.) Type :- 'M'.

Object :- III, To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey—pH. 7.2. (iii) Nil. (iv) and (v) N.A. (vi) October—November. (vii) Unirrigated. (viii) and (ix) N.A. (x) April—May.

2. TREATMENTS :

O = Control.
 N = A/S at 20 lb./ac. of N.
 NP = A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P₂O₅.
 NP' = A/S at 20 lb./ac. of N+Nitro. phos. at 20 lb./ac. of P₂O₅.
 NP'' = A/S at 20 lb./ac. of N+Ammo. Phos. at 20 lb./ac. of P₂O₅.
 NP''' = A/S at 20 lb./ac. of N+B.M. at 20 lb./ac. of P₂O₅.
 Fertilizers broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatments	Av. yield in lb./ac.
O	526
N	560
NP'	554
NP''	612
NP'''	622
G.M.	575
S.E./mean	26.91 lb./ac.
No. of expts.	3

Crop :-Wheat. Ref :-Simple trials on cultivators' fields (T.C.M.), 1953.

Centre :-Arki-Solan (H.P.)

Type :-'M'.

Object :—III, To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Sandy to clayey—pH. 7.2. (iii) Nil. (iv) and (v) N.A. (vi) October—November. (vii) Irrigated. (viii) and (ix) N.A. (x) April—May.

2. TREATMENTS :

O =Control.

N =A/S at 20 lb./ac. of N.

NP =A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P_2O_5 .

NP' =A/S at 20 lb./ac. of N+Nitro. phos. at 20 lb./ac. of P_2O_5 .

NP'' =A/S at 20 lb./ac. of N+Ammo. Phos. at 20 lb./ac. of P_2O_5 .

Fertilizers broadcast before sowing.

3. DESIGN :

(i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953—1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS :

Treatments	Av. yield in lb./ac.
O	766
N	932
NP	887
NP'	888
NP''	959
G.M.	886
S.E./mean	74.46
No. of Experiments	9

Crop :- Wheat (*Rabi*).

Ref :- H.P. 53(251).

Site :- Cereal Multiplication Farm, Bhanota.

Type :- 'MV'.

Object :—To study the manurial requirements of different varieties of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 22.11.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 23.94". (x) 4th week of April to 1st week of May 1954.

2. TREATMENTS :

Main-plot treatments :

4 varieties : V_1 =NP-770, V_2 =Ridly, V_3 =S—100 and V_4 =Local.

Sub-plot treatments :

4 manures : M_0 =0, M_1 =100 lb./ac. of A/S, M_2 =100 lb./ac. of Super and M_3 =100 lb./ac. of A/S+100 lb./ac. of Super.

3. DESIGN :

(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) N.A. (iv) (a) and (b) 15'×3'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not contd. (b) No. (c) —. (v) (a) No. (b) —. (vi) Nil. (vii) Plot wise yield not available.

5. RESULTS :

- (i) 1092 lb./ac.
 (ii) (a), (b) and (iii) N.A.
 (iv) Av. yield of grain in lb./ac.

	M ₀	M ₁	M ₂	M ₃	Mean
V ₁	747	1557	996	1618	1230
V ₂	187	933	373	1304	699
V ₃	436	1058	684	1182	840
V ₄	871	1618	2343	1557	1597
Mean	560	1292	1099	1415	1092

S.E.'s = N.A.

Crop :- Wheat.

Site :- Potato Dev. and Res. Stn., Shilaroo.

Ref :- H.P. 53(237).

Type :- 'MV'.

Object :—To study the effect of manure on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Potato. (c) Nil. (ii) (a) Clayey to loam. (b) N.A. (iii) 18.10.1953. (iv) (a) and (b) N.A. (c) 40 sr./ac. (d) 9" row to row. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 18.32". (x) 4.7.1954.

2. TREATMENTS :

Main-plot treatments :

3 varieties : V₁=NP-770, V₂=S-100 and V₃=Local.

Sub-plot treatments :

All combinations of (1) and (2)

- (1) 2 levels of N as A/S : N₀=0 and N₁=20 lb./ac.
 (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=15 lb./ac.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40'×9'. (b) 6'×37'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 245.20 lb./ac.
 (ii) (a) 212.07 lb./ac.
 (b) 100.16 lb./ac.

- (iii) Only P effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	Mean	P ₀	P ₁
V ₁	198.9	198.9	198.9	144.4	253.4
V ₂	180.4	151.2	165.8	110.4	221.2
V ₃	384.6	357.3	370.9	307.8	434.2
Mean	254.6	235.8	245.2		
P ₀	185.6	189.4	187.5		
P ₁	323.7	282.2	302.9		

S.E. of marginal mean of N or P	=20.45 lb./ac.
S.E. of body of N×P table	=28.90 lb./ac.
S.E. of difference of two	
1. V marginal means	=74.98 lb./ac.
2. N or P means at the same level of V	=50.08 lb./ac.
3. V means at the same level of N or P	=82.92 lb./ac.

Crop :- Wheat (*Rabi*).

Ref. :- H.P. 53(250)

Site :- Cereal Multiplication Farm, Bhanota.

Type :- 'CV'.

Object :- To find out the optimum date of sowing for Wheat varieties.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loam. (b) Refer soil analysis, Bhanota. (iii) As per treatments
 (iv) (a) and (b) N.A. (c) 82l b./ac. (d) and (e) N.A. (v) N.A. (vi) As per treatments.
 (vii) Unirrigated. (viii) Nil. (ix) 23.94%. (x) 4th week of April to 1st week of May, 1954.

2. TREATMENTS :

Main-plot treatments :

3 dates of sowing : D₁=18.10.1953, D₂=10.11.1953 and D₃=25.11.1953.

Sub-plots treatments :

4 varieties : V₁=Local, V₂=S-100, V₃=Ridley and V₄=NP-770.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 15'×3'.
 (b) 15'×3'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —.
 (v) (a) No. (b) —. (vi) Nil. (vii) Plot-wise yield not available.

5. RESULTS :

- (i) 793 lb./ac.
 (ii) and (iii) N.A.
 (iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	Mean
V ₁	1120	1182	622	975
V ₂	996	809	373	726
V ₃	871	436	498	602
V ₄	1182	871	560	871
Mean	1042	825	513	793

S.E.s N.A.

Crop :- Wheat (*Rabi*)

Ref :- H.P. 53(173).

Site :- Seed Multiplication Cum-Demons. Farm, Bhangrotu. Type :- 'CV'.

Object :- To find suitable varieties for different sowing dates for Wheat crop.

1. BASAL CONDITIONS.

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Loamy. (b) N.A. (iii) As per treatments. (iv) (a), (b) N.A. (c) 41.25 sr./ac. (d) row to row 9". (e) N.A. (v) 40 lb./ac. of N as F.Y.M. (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) 11.68". (x) 1st week of May, 1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 4 dates of sowing : $D_1=25.10.1953$, $D_2=8.11.1953$, $D_3=22.11.1953$ and $D_4=5.12.1953$.(2) 6 varieties : $V_1=C-591$, $V_2=NP-770$, $V_3=C-250$, $V_4=C-225$, $V_5=S-100$ and $V_6=Ridley$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 6'x22'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Lodging from 25% to 100%. (ii) Slight attack of black and brown rust and also slight incident of loose smut. (iii) Germination percentage, stand percentage, tillering/plot and yield/plot. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 1134 lb./ac.

(ii) 527.0 lb./ac.

(iii) N.A.

(iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	1119	813	912	1322	1047
V ₂	1117	1782	1436	1089	1356
V ₃	1018	1287	1365	1131	1200
V ₄	962	820	1103	1004	972
V ₅	1280	1167	1181	1414	1261
V ₆	1089	1174	636	976	969
Mean	1101	1174	1106	1156	1134

S.E. of marginal mean of V = 152.1 lb./ac.

S.E. of marginal mean of D = 124.2 lb./ac.

S.E. of body of table = 304.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref. :- H.P. 53(240).

Site :- Agri. Res. Stn., Dhaula Kuan.

Type :- 'CV'.

Object :- To find out the optimum date of sowing for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) Refer soil analysis, Dhaula kuan. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 12.20". (x) Mid of May. 1954.

2. TREATMENTS :

Main-plot treatments :

3 sowing dates : $D_1=10.10.1953$, $D_2=25.10.1953$ and $D_3=2.11.1953$.

Sub-plot treatments :

3 varieties : $V_1=NP-770$, $V_2=S-100$ and $V_3=Local$.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A.
 (b) 1/403.33 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) —.
 (v) (a) Shilaroo, Parala. (b) N.A. (vi) & (vii) Nil.

5. RESULTS :

- (i) 1118 lb./ac.
 (ii) (a) 364.4 lb./ac.
 (b) 291.5 lb./ac.
 (iii) Only V effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean
D ₁	726	1945	1050	1240
D ₂	946	1517	817	1093
D ₃	648	1413	998	1020
Mean	773	1625	955	1118

S.E. of difference of two

1. D marginal means =148.8 lb./ac.
2. V marginal means =118.9 lb./ac.
3. V means at the same level of D =206.1 lb./ac.
4. D means at the same level of V =224.6 lb./ac.

Crop :- Wheat (Rabi).

Ref :-H.P. 53(239).

Site :- Cereal Multiplication Farm, Parala.

Type :- 'CV'.

Object :-To find the optimum date of sowing for Wheat crop.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 20.43%. (x) N.A.

2. TREATMENTS :**Main-plot treatments :**

3 sowing dates : D₁=1.10.1953, D₂=15.10.1953 and D₃=7.11.1953.

Sub-plot treatments :

3 varieties : V₁=NP-770, V₂=S-100 and V₃=Local.

3. DESIGN :

- (i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 9' x 55'.
 (v) Nil. (vi) Yes.

4. GENERAL :

- (i) Poor. Local variety lodged 20-40%. (ii) Slight attack of rust. (iii) Germination %, stand %, growth, vigour and grain yield/plot. (iv) (a) 1953-54 with modification. (b) No. (c) N.A. (v) (a) Shilaroo, Parala and Dhaula Kuan. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

- (i) 570.1 lb./ac.
 (ii) (a) 164.1 lb./ac.
 (b) 200.9 lb./ac.
 (iii) Only D effect is significant.

(iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean
D ₁	551.6	769.4	684.5	668.5
D ₂	526.1	376.2	379.0	427.1
D ₃	537.4	678.9	627.9	614.7
Mean	538.4	608.2	563.8	570.1

S.E. of difference of two

1. D marginal means = 67.0 lb./ac.
2. V marginal means = 82.1 lb./ac.
3. V means at the same level of D = 142.1 lb./ac.
4. D means at the same level of V = 134.0 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :-H.P. 51(120).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :-'CV'.

Object :-To find out the optimum time of sowing under unirrigated condition.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Loamy to clayey. (b) N.A. (iii) 10.10.1951, 22.10.1951, 7.11.1951 and 22.11.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 9.01". (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 4 sowing dates : D₁=10.10.1951, D₂=22.10.1951, D₃=7.11.1951 and D₄=21.11.1951.
- (2) 3 varieties : V₁=NP-770, V₂=Ridley (strain D) and V₃=Local.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 6' x 40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Slight attack of yellow rust. (iii) Germination %, height and tillering, straw % and grain yield. (iv) (a) Not continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 503.4 lb./ac.
- (ii) 141.1 lb./ac.
- (iii) V effect is highly significant while D effect is significant.
- (iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	D ₄	Mean
V ₁	378.1	408.4	559.6	514.2	465.1
V ₂	264.2	324.9	514.3	355.1	364.7
V ₃	566.9	710.9	808.9	635.2	680.5
Mean	403.1	481.4	627.6	501.5	503.4

- S.E. of marginal mean of D = 47.03 lb./ac.
 S.E. of marginal mean of V = 40.73 lb./ac.
 S.E. of body of table = 81.46 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- H.P. 53(238).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'CV'.

Object :- To find the optimum date of sowing for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Potato. (c) N.A. (ii) (a) Clayey to loamy. (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 18.32°. (x) N.A.

2. TREATMENTS :

Main-plot treatments :

3 sowing dates : $D_1=10.10.1953$, $D_2=15.10.1953$ and $D_3=30.10.1953$.

Sub-plot treatments :

3 varieties : $V_1=Local$, $V_2=NP-770$ and $V_3=S-103$.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/blok ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18'×40'. (main-plot) ; 6'×40' (sub-plot). (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) —. (v) (a) Shilaroo, Parala, Dhaula Kuan. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 124.1 lb./ac.

(ii) (a) 64.46 lb./ac.

(b) 71.41 lb./ac.

(iii) D effect is significant, V effect is highly significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	Mean
D_1	300.5	154.6	72.9	176.0
D_2	160.4	137.1	58.3	118.6
D_3	145.9	67.1	20.4	77.8
Mean	202.2	119.6	51.6	124.1

S.E. of difference of two

1. D marginal means =26.3 lb./ac.
2. V marginal means =29.1 lb./ac.
3. V means at the same level of D =50.5 lb./ac.
4. D means at the same level of V =48.9 lb./ac.

Crop :- Barley.

Ref :- H.P. 53(242).

Site :- Agri. Res. Stn., Dhaula Kuan.

Type :- 'M'.

Object :- To find the best manurial formula for Barley.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) Refer soil analysis, Dhaula kuan. (iii) 12.11.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) N.P. 13 (medium). (vii) Unirrigated. (viii) Nil. (ix) 12.28°. (x) End of April.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of N as A/S : $N_0=0$ and $N_1=20$ lb./ac.(2) 3 applications of P_2O_5 : $P_0=0$, $P_1=20$ lb./ac. of P_2O_5 as Super and $P_2=20$ lb./ac. of P_2O_5 as B.M.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 6'×18'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Straw and grain yield. (iv) (a) Not.-contd.(b) No. (c)—. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2027 lb./ac.
 (ii) 422.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	P ₀	P ₁	P ₂	Mean
N ₀	1841	2126	2040	2002
N ₁	2109	2057	1988	2051
Mean	1975	2091	2014	2027

S.E. of marginal mean of P = 122.0 lb./ac.
 S.E. of marginal mean of N = 99.6 lb./ac.
 S.E. of body of table = 172.5 lb./ac.

Crop :-Potato.

Ref :-H.P. 51(124).

Site :-Potato Dev. Res. Stn., Shilaroo.

Type :-'M'.

Object :—To study the effect of N, P₂O₅ and K₂O in presence and absence of organic matter.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 5.5.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Upto date (medium). (vii) Unirrigated. (viii) 2 hoeings and 2 earthings. (ix) 49.51". (x) End of September 1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M : F₀=0 and F₁=400 lb./ac. of F.Y.M.

Sub-plot treatments :

All combinations of (1), (2) and (3)

- (1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac.
 (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=80 lb./ac.
 (3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=20 lb./ac.

F.Y.M. applied one week before planting by mixing in soil.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×5.25'. (v) One buffer row maintained between two adjacent plots. In addition a length of 2' was cut at both the extremities of ridges to eliminate effect of extra spacing. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 19142 lb./ac.
 (ii) (a) 6285.4 lb./ac.
 (b) 4769.1 lb./ac.
 (iii) N and F effects are significant, P effect is highly significant, while all other effects are not significant.

(iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	P ₀	P ₁	K ₀	K ₁	Mean
F ₀	20394	23166	17659	25902	21817	21744	21780
F ₁	15407	17600	11797	21209	15851	17156	16503
Mean	17901	20383	14728	23556	18834	19450	19142
K ₀	17691	19977	14457	23210			
K ₁	18111	20789	14999	23901			
P ₀	14907	14550					
P ₁	20895	26216					

S.E. of difference of two

1. F marginal means =1571.3 lb./ac.
2. N, P or K marginal means =1192.3 lb./ac.
3. Means in the body of N×P, N×K or P×K tables =1686.1 lb./ac.
4. N, P or K means at the same level of F =1686.1 lb./ac.
5. F means at the same level of N, P or K =1972.5 lb./ac.

Crop :-Potato.

Ref :-H.P. 52(157).

Site :-Potato Dev. and Res. Stn. Shilaroo.

Type :-'M'.

Object :—To study the effect of N, P₂O₅ and K₂O in presence and absence of organic matter.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Nil. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 28.4.1952. (iv) (a) to (e) N.A. (v) Nil. (vi) Uptodate (medium). (vii) Unirrigated. (viii) Hoeings on 1,3,6.1952 and earthing up on 6,7.1952. (ix) 30.42". (x) 24.9.1952.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : F₀=0 and F₁=400 lb./ac. of F.Y.M.

Sub-plot treatments :

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac.(2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=80 lb./ac.(3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=20 lb./ac.

F.Y.M. applied one week before planting by mixing in soil.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×5.25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to Normal. No lodging. (ii) Disease N.A. sprayed twice with pernoxone. (iii) Tuber yield. (iv) (a) 1951—1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 22319 lb./ac.
- (ii) (a) 4205.6 lb./ac.
- (b) 7201.0 lb./ac.
- (iii) F effect is significant, while P effect is highly significant.

(iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	P ₀	P ₁	K ₀	K ₁	Mean
F ₀	23626	26559	21279	28906	25172	25012	25092
F ₁	17813	21279	15626	23466	19413	19679	19545
Mean	20719	23919	18453	26186	22292	22346	22319
K ₀	21385	23199	17706	26879			
K ₁	20053	24639	19199	25492			
P ₀	17119	19786					
P ₁	24319	28052					

S.E. of difference of two

- | | |
|---|-----------------|
| 1. F marginal means | 1051.4 lb./ac. |
| 2. N, P or K marginal means | 1800.2 lb./ac. |
| 3. Means in the body of N×P, N×K or P×K table | =2546.0 lb./ac. |
| 4. N, P or K means at the same level of F | =2546.0 lb./ac. |
| 5. F means at the same level of N, P or K | =2084.8 lb./ac. |

Crop :- Potato.

Ref :- H.P. 53(230).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To study the effect of N, P₂O₅ and K₂O in presence and absence of organic matter.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 3.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Uptodate (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 earthing. (ix) 47.78". (x) End of Sept. 1953.

2. TREATMENTS:

Main-plot treatments:

2 levels of F.Y.M. : F₀=0 and F₁=400 lb./ac. of F.Y.M.

Sub-plot treatments:

All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S : N₀=0, and N₁=40 lb./ac.

(2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=80 lb./ac.

(3) 2 levels of K₂O as Pot. Sul. : K₀=0 and K₁=20 lb./ac.

F.Y.M. applied one week before planting by mixing in soil.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'×5.25' (b) 10'×5.25'. (v) No. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Germination count and tuber yield. (iv) (a) 1951-1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

(i) 9672 lb./ac.

(ii) (a) 1731.5 lb./ac.

(b) 2589.4 lb./ac.

(iii) F, N and P effects are highly significant. Other effects are not significant.

(iv) Av. yield of tuber in lb./ac.

	N ₀	N ₁	P ₀	P ₁	K ₀	K ₁₁	Mean
F ₀	5592	7462	4167	8887	5852	7202	6527
F ₁	11178	14456	11320	14314	12835	12799	12817
Mean	8385	10959	7743	11600	9343	10300	9672
K ₀	8584	10102	7347	11339			
K ₁	8185	11816	8139	11861			
P ₀	7070	8417					
P ₁	9699	1301					

S.E. of difference of two

1. F marginal means =432.9 lb./ac.
2. N, P or K marginal means =647.3 lb./ac.
3. means in the body of N×P, N×K or P×K tables =915.5 lb./ac.
4. N, P or K means at the same level of F =915.5 lb./ac.
5. F means at the same level of N, P or K =778.7 lb./ac.

Crop :- Potato.

Ref :- H.P. 52(159).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To find the best time and method of application of fertilizers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 3rd week of April, 1952. (iv) (a) to (e) N.A. (v) 400 md./ac. of F.Y.M. given a week before sowing. (vi) Up to date. (vii) Unirrigated. (viii) One earthing. (ix) 30.42". (x) 28.9.1952.

2. TREATMENTS :

All combinations of (1)×(2)+a control

(1) 3 times of application fertilizers : T₁=At planting, T₂=At earthing up and T₃=Half at planting and half at earthing up.

(2) 3 methods of application of fertilizers : M₁=Broadcast, M₂=In furrows and M₃=Side bund.

Fertilizer dose is 40 lb./ac. of N as A/S+80 lb./ac. of P₂O₅ as Super+20 lb./ac. of K₂O as Pot. Sul.M₁=Fertilizer mixed in 1 : 5 ratio with soil and spread uniformly.M₂=Furrows were opened 6" deep. The fertilizer was put in furrows by hand. This was covered with layer about 2". The seed tubers were put above this line.M₃=Furrows were opened on either side of tuber line 2½" apart and 4" deep and fertilizer placed in these lines.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10'×5.25'. (v) One buffer was maintained between adjacent plots to ward off border effect and a length of 2' at both extremities of ridges to eliminate effect of extra spacing. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1952-1954. (b) No. (c) N.A. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 24660 lb./ac.

(ii) 5425.4 lb./ac.

(iii) Control vs other treatment effect and T effect are highly significant while M effect is significant.

(iv) Av. yield of tuber in lb./ac.

Control=13013 lb./ac.

	M ₁	M ₂	M ₃	Mean
T ₁	26239	31572	31572	29794
T ₂	18986	27732	19626	22115
T ₃	23252	27092	27519	25954
Mean	22826	28799	26239	25954

S.E. of any marginal mean = 1566.2 lb./ac.
 S.E. of body of table = 2712.7 lb./ac.

Crop :- Potato.

Ref :- H.P. 53(232).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To find the best time and method of application of fertilisers.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 4.5.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Up to date (medium). (vii) Unirrigated. (viii) N.A. (ix) 47.73". (x) End of Sept. 1953.

2. TREATMENTS :

All combinations of (1) and (2)+a control

(1) 3 times of application of fertilizers : T₁=At planting, T₂=At earthing up and T₃=Half at planting and half at earthing up.

(2) 3 methods of application of fertilizers : M₁=Broadcast, M₂=In furrows and M₃=Side bund.
 Fertilizer dose is 40 lb./ac. of N as A/S+80 lb./ac. of P₂O₅ as Super+20 lb./ac. of K₂O as Pot. Sul.

3. DESIGN :

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10' x 5.25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) No. of plants at harvest and tuber yield. (iv) (a) 1952 to 1954. (b) No. (c) -. (v) (a) No. (b) -. (vi) and (vii) Nil.

5. RESULTS :

(i) 7142 lb./ac.

(ii) 2248.6 lb./ac.

(iii) Control vs other treatments effect and M effect are significant while T effect is highly significant.

(iv) Av. yield of tuber in lb./ac.

Control = 3787 lb./ac.

	M ₁	M ₂	M ₃	Mean
T ₁	10428	10721	8167	9752
T ₂	3360	5547	5067	4658
T ₃	6561	10801	7041	8134
Mean	6783	9023	6738	7515

S.E. of any marginal mean = 649.1 lb./ac.
 S.E. of body of table = 1124.3 lb./ac.

Crop :- Potato.

Ref :- H.P. 51 (122).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To study proper dose of fertilizer required for obtaining maximum germination and yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 24.4.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Up to date (medium). (vii) Unirrigated. (viii) Hoeing on 29.5.1951, gap filling on 30.5.1951, earthing up and application of fertilizers on 4.7.1951. (ix) 49.15". (x) End of September.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0=0$ and $F_1=400$ md./ac. of F.Y.M.

Sub-plot treatments :

4 doses of fertilizers : $M_0=0$ (control), $M_1=A/S$ at 3 cwt./ac.+Super at 4 cwt./ac.+Pot. Sul. at 2 cwt./ac. (heavy dose), $M_2=A/S$ at 1.5 cwt./ac.+Super at 2 cwt./ac.+Pot. Sul. at 1 cwt./ac. (medium dose) and $M_3=A/S$ at 0.75 cwt./ac.+Super at 1 cwt./ac.+Pot. Sul. at 0.50 cwt./ac. (light dose).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $10' \times 5.25'$. (b) $8' \times 5.25'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) No. (iii) Tuber yield and germination count. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) N.A.

5. RESULTS :

(i) 17192 lb./ac.

(ii) (a) 2427.8 lb./ac.

(b) 3047.3 lb./ac.

(iii) F effect is significant, M effect is highly significant while interaction is not significant.

(iv) Av. yield of tuber in lb./ac.

	M_0	M_1	M_2	M_3	Mean
F_0	11665	15767	12967	18034	14608
F_1	16834	18935	20567	22765	19775
Mean	14249	17351	16767	20399	17192

S.E. of difference of two

1. F marginal means = 858.4 lb./ac.

2. M marginal means = 1523.6 lb./ac.

3. M means at the same level of F = 2154.8 lb./ac.

4. F means at the same level of M = 2054.1 lb./ac.

Crop :- Potato.

Ref :- H.P. 51(126).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To study proper dose of fertilizer required for obtaining maximum germination and yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 24.4.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Craigs Defiance (medium.) (vii) Unirrigated. (viii) Hoeing on 29.5.1951, gap filling on 30.5.1951 and earthing up on 4.7.1951. (ix) 49.15". (x) 28.9.1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0=0$ and $F_1=400$ md/ac. of F.Y.M.

Sub-plot treatments :

4 doses of fertilizers : $M_0=0$ (control), $M_1=A/S$ at 3 cwt/ac.+Super at 4 cwt/ac.+Pot. Sul. at 2 cwt/ac. (heavy dose) $M_2=A/S$ at 1.5 cwt/ac.+Super at 2 cwt/ac.+Pot. Sul. at 1 cwt/ac. (medium dose) and $M_3=A/S$ at 0.75 cwt/ac.+Super at 1 cwt/ac.+Pot. Sul. at 0.50 cwt/ac. (light dose).

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot (b) N.A. (iii) 4. (iv) (a) $10' \times 5.25'$. (b) $8' \times 5.25'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) No. (iii) Germination count and tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) N.A.

5. RESULTS :

- (i) 10260 lb./ac.
 (ii) (a) 5912.9 lb./ac.
 (b) 3517.4 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of tuber in lb./ac.

	M_0	M_1	M_2	M_3	Mean
F_0	9964	8950	10636	11628	10294
F_1	12935	14748	13025	14599	13827
Mean	11449	11849	11830	13113	12060

S.E. of difference of two

1. F marginal means =2520.4 lb./ac.
 2. M marginal means =1758.7 lb./ac.
 3. M means at the same level of F =2487.2 lb./ac.
 4. F means at the same level of M =3001.6 lb./ac.

Crop :- Potato.

Ref :- H.P. 51(125).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To determine the best time and depth at which fertilizers should be applied to obtain maximum yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 6.5.1951. (iv) (a) to (e) N.A. (v) Nil. (vi) Upto date (medium). (vii) Unirrigated. (viii) 3 hoeings and earthing up. (ix) 49.51". (x) 16.9.1951.

2. TREATMENTS :

Main-plot treatments :

2 levels of F.Y.M. : $F_0=0$ and $F_1=400$ md/ac. of F.Y.M.

Sub-plot treatments :

6 applications of fertilizers : $M_0=$ No fertilizers, $M_1=$ Full dose of fertilizer at planting on surface, $M_2=$ Full dose of fertilizer at earthing on surface, $M_3=$ Full dose of fertilizer at earthing 3" below surface, $M_4=$ Half dose of fertilizer at planting+half dose at earthing on surface and $M_5=$ Half dose of fertilizer at planting+half dose at earthing 3" below surface.

Full dose of fertilizer consists of 40 lb./ac. of N as A/S+80 lb./ac. of P_2O_5 as Super and 20 lb./ac. of N as Pot. Sul. applied on 8, 9th July.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10'×5.25'.
(b) 8'×5.25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —.
(vi) and (vii) Nil.

5. RESULTS :

- (i) 17996 lb./ac.
(ii) (a) 7431.7 lb./ac.
(b) 4730.2 lb./ac.
(iii) Only sub-plot treatments are highly significantly different.
(iv) Av. yield of tuber in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	Mean
F ₀	11302	26440	14102	16770	22872	17644	18188
F ₁	14769	21671	14465	12534	23837	19538	17803
Mean	13036	24056	14284	14652	23354	18591	17996

S.E. of difference of two

1. F marginal means = 2145.3 lb./ac.
2. M marginal means = 2365.1 lb./ac.
3. M means at the same level of F = 3344.8 lb./ac.
4. F means at the same level of M = 3731.7 lb./ac.

Crop :- Potato.

Ref :- H.P. 51(127).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'M'.

Object :- To determine the best time and depth at which fertilizers should be applied to obtain maximum yield.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clay to loam. (b) N.A. (iii) 6.5.1951. (iv) (a) to (e) N.A.
(v) Nil. (vi) Craigs defiance (medium). (vii) Unirrigated. (viii) 3 hoeings and earthing up. (ix) 49.15".
(x) 26.9.1951.

2. TREATMENTS :**Main-plot treatments :**

2 levels of F.Y.M. : F₀=0 and F₁=400 md./ac. of F.Y.M.

Sub-plot treatments :

6 applications of fertilizers : M₀=No fertilizers, M₁=Full dose of fertilizer at planting on surface, M₂=Full dose of fertilizer at earthing on surface, M₃=Full dose of fertilizer at earthing 3" below surface, M₄=Half dose of fertilizer at planting + half dose at earthing on surface and M₅=Half dose of fertilizer at planting + half dose at earthing 3" below surface.

Full dose of fertilizer consists of 40 lb./ac. of N as A/S+80 lb./ac. of P₂O₅ as Super and 20 lb./ac. of N as Pot. Sul. applied on 8,9th July.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8'×5.25'.
(v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —.
(vi) and (vii) Nil.

5. RESULTS :

- (i) 17294 lb./ac.
(ii) (a) 8830.0 lb./ac.
(b) 9484.0 lb./ac.
(iii) All effects are not significant.
(iv) Av. yield of tuber in lb./ac.

	M ₀	M ₁	M ₂	M ₃	M ₄	M ₅	Mean
F ₀	19533	17234	11937	8230	15202	20541	15446
F ₁	15532	17970	15138	12038	24365	17804	17141
Mean	17532	17602	13537	10134	19783	19172	16294

S E. of difference of two

1. F marginal means =2549.0 lb./ac.
2. M marginal means =4741.9 lb./ac.
3. M means at the same level of F =6706.2 lb./ac.
4. F means at the same level of M =6631.4 lb./ac.

Crop :- Potato.

Ref :- H.P. 53(231).

Site :- Potato Dev. and Res. Stn , Shilaroo.

Type :- 'M'.

Object :- To determine the optimum dose of artificial mixture of N, P₂O₅ and K₂O combined with different levels of F.Y.M.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 3.5.1953. (iv) (a) to (c) N.A. (d) Row to row 21" and plant to plant 12". (e) N.A. (v) Nil. (vi) Upto date (medium). (vii) Unirrigated. (viii) N.A. (ix) 47.78%. (x) 4.9.1953.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 3 levels of F.Y.M. : F₁=100, F₂=200 and F₃=400 md./ac. of F.Y.M.

(2) 4 levels of artificial mixture : M₀=0, M₁=200, M₂=400 and M₃=600 md./ac.

F.Y.M. spread in the plots and mixed with soil by *khilua* and just before planting artificial mixture was applied on both sides of a row 3" apart and 2" below the soil surface on 3.5.1953.

Artificial mixture is a mixture of N, P₂O₅ and K₂O in the ratio of 2 : 4 : 1.

3. DESIGN :

- (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10' x 5.25'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal No lodging. (ii) Damage by rats. (iii) Germination count and tuber yield. (iv) (a) to (c) No. (v) (a) No (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 15443 lb./ac.
(ii) 3114.9 lb./ac.
(iii) Only "control vs. other treatments" effect is highly significant.

(iv) Av. yield of tuber in lb./ac.

Control = 7625 lb./ac.					
	M ₀	M ₁	M ₂	M ₃	Mean
F ₁	15413	11679	16646	15310	14762
F ₂	16002	15148	17764	18871	16946
F ₃	19573	16906	13441	16479	16600
Mean	16996	14578	15950	16887	16103

S.E. of marginal mean of F = 778.8 lb./ac.
 S.E. of marginal mean of M = 899.2 lb./ac.
 S.E. of body of table = 1557.5 lb./ac.

Crop :- Potato.

Ref :- H.P. 51(123).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'C'.

Object -- To study the effect of spacing and seed size on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 3rd week of April. (iv) (a) and (b) N.A. (c) R₁S₁=25, R₁S₂=50, R₁S₃=75. R₂S₁=20, R₂S₂=40, R₂S₃=60, R₃S₁=16.6, R₃S₂=33.2 and R₃S₃=49.8 md./ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) upto date (medium). (vii) Unirrigated. (viii) 2 hoeings, 1 earthing and 1 gap filling. (ix) 49.15". (x) End of September.

2. TREATMENTS :

Main-plot treatments :

3 row to row spacings : R₁=16", R₂=20" and R₃=24".

Sub-plot treatments :

3 seed sizes : S₁=1 oz., S₂=2 oz. and S₃=3 oz.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10' x 7'. (b) 8' x 7'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1951-1953. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

(i) 10076 lb./ac.

(ii) (a) 4664.1 lb./ac.

(b) 4018.2 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of tuber in lb./ac.

	S ₁	S ₂	S ₃	Mean
R ₁	10460	14767	7271	10832
R ₂	9888	10014	7536	9146
R ₃	11986	8566	10200	10251
Mean	10778	11115	8336	10076

S.E. of difference of two

1. R marginal means = 1904.1 lb./ac.
2. S marginal means = 1640.5 lb./ac.
3. S means at the same level of R = 2841.3 lb./ac.
4. R means at the same level of S = 3001.3 lb./ac.

Crop :- Potato.

Ref :- H.P. 52(158).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'C'.

Object :- To study the effect of spacing and seed size on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamey. (b) N.A. (iii) 20.4.1952. (iv) (a) and (b) N.A. (c) $R_1S_1=25$, $R_1S_2=50$, $R_1S_3=75$, $R_2S_1=20$, $R_2S_2=40$, $R_2S_3=60$, $R_3S_1=16.6$, $R_3S_2=33.2$ and $R_3S_3=49.8$ md./ac. (d) As per treatments. (e) N.A. (v) 400 md./ac. of F.Y.M. (vi) Upto date (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 earthing up. (ix) 30.42". (x) 29.9.1952.

2. TREATMENTS :

Main-plot treatments :

3 row to row spacings : $R_1=16"$, $R_2=20"$ and $R_3=24"$.

Sub-plot treatments :

3 seed sizes : $S_1=1$ oz., $S_2=2$ oz. and $S_3=3$ oz.

3. DESIGN :

(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $10' \times 7'$. (b) $8' \times 7'$. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) 1951—1953. (b) No. (c) Nil. (v) (a) No. (b)—. (vi) and (vii) Nil.

5. RESULTS :

(i) 18878 lb./ac.

(ii) (a) 5071 lb./ac.

(b) 4140.6 lb./ac.

(iii) Only S effect is significant.

(iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
R_1	18175	22190	24304	21556
R_2	15614	15614	19687	16971
R_3	13860	22681	17781	18107
Mean	15883	20162	20590	18878

S.E. of difference of two

1. R marginal means = 2070.2 lb./ac.
2. S marginal means = 1690.4 lb./ac.
3. S means at the same level of R = 2927.9 lb./ac.
4. R means at the same level of S = 3162.4 lb./ac.

Crop :- Potato.

Ref :- H.P. 53(233).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'C'.

Object :- To study the effect of spacing and seed size on the yield of Potato.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 4.5.1953. (iv) (a) and (b) N.A. (c) $R_1S_1=25$, $R_1S_2=50$, $R_1S_3=75$, $R_2S_1=20$, $R_2S_2=40$, $R_2S_3=60$, $R_3S_1=16.6$, $R_3S_2=33.2$ and $R_3S_3=49.8$ md./ac. (d) and (e) N.A. (v) 400 md./ac. of F.Y.M. (vi) Up to date (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 earthing up. (ix) 47.78". (x) End of Sept. 1953.

2. TREATMENTS :**Main-plot treatments :**3 row to row spacings : $R_1=16''$, $R_2=20''$ and $R_3=24''$.**Sub-plot treatments :**3 seed sizes : $S_1=1$ oz., $S_2=2$ oz. and $S_3=3$ oz.**3. DESIGN :**(i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $10' \times 7'$.
(b) $8' \times 7'$. (v) N.A. (vi) Yes.**4. GENERAL :**(i) Fair to normal. No lodging. (ii) Nil. (iii) Germination count and tuber yield. (iv) (a) 1951-1953.
(b) No. (c) N.A. (v) (a) No. (b) —. (vi) and (vii) Nil.**5. RESULTS :**

- (i) 8336 lb./ac.
 (ii) (a) 5975 lb./ac.
 (b) 2987 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of tuber in lb./ac.

	S_1	S_2	S_3	Mean
R_1	6649	6973	7897	7173
R_2	5577	8877	9773	7976
R_3	11173	7077	11325	9858
Mean	7700	7642	9665	8336

S.E. of difference of two

1. R marginal means = 2431 lb./ac.
2. S marginal means = 1219 lb./ac.
3. S means at the same level of R = 2112 lb./ac.
4. R means at the same level of S = 2987 lb./ac.

Crop :- Potato.**Ref :- H.P. 53(234).****Site :- Potato Dev. and Res. Stn , Shilaroo.****Type :- 'C'.****Object :-**To find out the proper depth of planting Potato seeds.**1. BASAL CONDITIONS :**(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 4.5.1953. (iv) (a) to (e) N.A. (v) N.A. (vi) Upto date (medium). (vii) Unirrigated. (viii) N.A. (ix) $47.78''$. (x) End of September.**2. TREATMENTS :**

1. Seeds planted at a depth of $3.0''$.
2. Seeds planted at a depth of $4.5''$.
3. Seeds planted at a depth of $6.0''$.

3. DESIGN :(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) $10' \times 7'$. (b) $8' \times 7'$. (v) N.A. (vi) Yes.**4. GENERAL :**

(i) Poor. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 371.7 lb./ac.
 (ii) 2393.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tubers in lb./ac.

Treatment	Av. yield
1.	2788
2.	5026
3.	3338
S.E /mean	= 846.3 lb./ac.

Crop :- Potato.

Ref :- H.P. 53 (236).

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'C'.

Object :-To see the beneficial effect, if any of green seed tubers before planting.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Loamy to clayey. (b) N.A. (iii) 7.5.1953. (iv) (a) to (e) N.A. (v) N.A. (vi) Upto date (medium). (vii) Unirrigated. (viii) 2 hoeings and 1 earthing up. (ix) 47.78%. (x) End of Sept. 1953.

2. TREATMENTS :

- Whole tubers ungreened, direct from store planted.
- Whole tubers greened, to be kept in light for two weeks and then planted.
- Cut tubers ungreened planted.
- Cut tubers greened planted.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10'×7'. (b) 8'×7'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Poor. No lodging. (ii) Nil. (iii) Potato yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2505 lb./ac.
 (ii) 1570.9 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tuber in lb./ac.

Treatment	Av. yield
1.	2134
2.	2984
3.	3017
4.	1884
S.E /mean	= 641.3 lb./ac.

Crop :- Potato.

Ref :- H.P. 53(235),

Site :- Potato Dev. and Res. Stn., Shilaroo.

Type :- 'C'.

Object :-To study the effect of cut tubers on germination and yield of Potato.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Clayey to loamy. (b) N.A. (iii) 6.5.1953. (iv) (a) to (e) N.A. (v) N.A. (vi) Upto date (medium). (vii) Unirrigated. (viii) N.A. (ix) 47.78%. (x) End of September. 1953.

2. TREATMENTS :

- Whole tubers planted.
- Freshly cut tubers planted.
- Freshly cut and dipped in solution of partially decomposed F.Y.M. + A/S and then planted.

3. DESIGN:

(i) R.B.D (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 8'×7'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Poor. No lodging. (ii) Nil. (iii) Tuber yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) —. (vi) and (vii) Nil.

5. RESULTS:

- (i) 5155 lb./ac.
 (ii) 2049.7 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of tuber in lb./ac.

Treatment	Av. yield
1.	5338
2.	3875
3.	6251
S.E./mean	=724.7 lb./ac.

Crop :- Berseem.

Ref. :- H.P. 53(241)

Site :- Agri Res. Stn., Dhaula Kuan.

Type :- 'M.'

Object :- To study the manurial requirements for Berseem fodder.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) Refer soil analysis, Dhaula Kuan. (iii) 28.10.1953. (iv) (a) to (e) N.A. (v) Nil. (vi) Mascavi. (vii) Irrigated. (viii) Nil. (ix) 12.28". (x) N.A.

2. TREATMENTS:

- Control.
- 200 lb /ac. of N as F.Y.M.
- 20 lb./ac. of N as A/S.
- 20 lb./ac. of P₂O₅ as Super.
- 20 lb./ac. of P₂O₅ as B.M.
- 20 lb./ac. of N as A/S. + 100 lb./ac. of N as F.Y.M.
- 20 lb./ac. of P₂O₅ as Supper + 100 lb./ac. of N as F.Y.M.
- 20 lb./ac. of P₂O₅ as B.M. + 100 lb./ac. of N as F.Y.M.
- 20 lb./ac of N as A/S + 20 lb./ac. of P₂O₅ as Super.
- 20 lb /ac. of N as A/S + 20 lb./ac. of P₂O₅ as B.M.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 6'×18' (v) Nil. (vi) Yes.

4. GENERAL:

(i) Fair. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) —. (vi) & (vii) Nil.

5. RESULTS:

- (i) 14.01 ton/ac.
 (ii) 1.71 ton/ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of fodder in ton/ac.

Treatment	Av. yield
1.	11.48
2.	14.51
3.	13.32
4.	14.82
5.	14.86
6.	12.71
7.	15.50
8.	14.56
9.	14.80
10.	13.58
S.E./mean	= 0.70 ton/ac.

JAMMU & KASHMIR

Crop :- Paddy (*Kharif*).

Ref :- J.K. 48(67).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of A/S, Super and Pot. Sul. on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 26.5.1948. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) 9.10.1948.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=60$ and $K_2=120$ lb./ac.

Manures applied on 20.7.1948.

3. DESIGNS :

(i) Fact. 3³ partially confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 4. (iv) (a) 40' x 5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1950. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2364 lb./ac.

(ii) 527.4 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	1906	2058	2274	2079	1989	2099	2150
N_1	1976	2489	2774	2413	2628	2198	2413
N_2	2172	2612	3014	2599	2381	2729	2688
Mean	2018	2386	2697	2364	2333	2342	2417
K_0	1818	2362	2818	2333			
K_1	2147	2305	2574	2342			
K_2	2090	2492	2669	2417			

S.E. of any marginal mean

= 88.0 lb./ac.

S.E. of body of table

= 152.2 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 49(92)
Type :- 'M'.

Object :- To study the effect of A/S, Super and Pot. Sul. on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11". (x) 5.10.1949.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.
(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.
(3) 3 levels of K_2O as Pot. Sul : $K_0=0$, $K_1=60$ and $K_2=120$ lb./ac.

3. DESIGN :

(i) Fact. 3^3 partially confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 4. (iv) (a) $40' \times 5'$. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1950. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3107 lb./ac.
(ii) 552.6 lb./ac.
(iii) Interaction NP alone is significant.
(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	3194	2685	3173	3017	2978	3091	2983
N_1	2574	3425	3027	3109	3167	2841	3319
N_2	3145	3184	3257	3195	3095	3453	3037
Mean	3071	3093	3152	3107			
K_0	3061	2928	3252	3080			
K_1	3016	3159	3209	3128			
K_2	3135	3208	2996	3113			

S.E. of any marginal mean = 92.1 lb./ac.
S.E. of body of table = 159.5 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 50(103).
Type :- 'M'.

Object :- To study the effect of A/S, Super and Pot. Sul. on yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.5.1950. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated (viii) N.A. (ix) 17.53". (x) 30.10.1950.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S : $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.

(2) 3 levels of P_2O_5 as Super : $P_0=0$, $P_1=25$ and $P_2=50$ lb./ac.

(3) 3 levels of K_2O as Pot. Sul. : $K_0=0$, $K_1=60$ and $K_2=120$ lb./ac.

3. DESIGN :

(i) Fact. 3^3 partially confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 4. (iv) (a) $5' \times 40'$. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1942—1950. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3521 lb./ac.

(ii) -666.0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	P_0	P_1	P_2	Mean	K_0	K_1	K_2
N_0	3265	3485	3456	3402	3122	3578	3506
N_1	3464	3509	3722	3565	3567	3412	3716
N_2	3593	3483	3716	3597	3468	3669	3656
Mean	3441	3492	3631	3521	3386	3553	3626
K_0	3254	3355	3548	3386			
K_1	3404	3395	3860	3553			
K_2	3664	3727	3487	3626			

S.E. of any marginal mean

=111.0 lb./ac.

S.E. of body of table

=192.5 lb./ac.

Crop :-Paddy (Kharif).

Ref :-J K. 48(68).

Site :-Rice Res. Stn., Khudwani.

Type :-'M'.

Object :-To study the effect of organic and inorganic manures individually and in mixture on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 27.5.1948.

(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated.

(viii) N.A. (ix) 8.01'. (x) 10.10.1948.

2. TREATMENTS ;

All combinations of (1) and (2)+a control.

(1) 2 levels of N : $N_1=30$ and $N_2=45$ lb./ac.

(2) 3 sources of N : $S_1=F.Y.M.$, $S_2=A/S$ and $S_3=F.Y.M.+A/S$.

F.Y.M. applied on 20.5.1948 while A/S on 21.7.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) $40' \times 5'$. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1942—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2266 lb./ac.
 (ii) 292.8 lb./ac.
 (iii) "Control vs. others effect" is highly significant and S effect is significant.
 (iv) Av. yield of grain in lb./ac.

Control = 1501 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	2229	2369	2489	2362
N ₂	2305	2407	2559	2424
Mean	2267	2388	2524	2393

S.E. of marginal mean of S = 84.5 lb./ac.
 S.E. of marginal mean of N = 69.0 lb./ac.
 S.E. of body of table = 119.5 lb./ac.

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 49(93).

Type :- 'M'.

Object :- To study the effect of organic and inorganic manures individually and in mixture on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 21.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11. (x) 2.10.1949.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

(1) 2 levels of N : N₁=30 and N₂=45 lb./ac.

(2) 3 sources of N : S₁=F.Y.M., S₂=A/S and S₃=F.Y.M.+A/S.

F.Y.M. applied on 12.5.1949. and A/S on 17.7.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 40'×5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1942—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3644 lb./ac.
 (ii) 425.8 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

Control=3129 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	3601	3667	3692	3653
N ₂	3616	3803	4000	3806
Mean	3608	3735	3846	3730

S.E. of marginal mean of S = 122.9 lb./ac.
 S.E. of marginal mean of N = 100.4 lb./ac.
 S.E. of body of table = 173.8 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 50(104).
Type :- 'M'.

Object :- To study the effect of organic and inorganic manures individually and in mixture on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) Clayey loam. (b) N.A. (iii) 23.5.1950. (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.53". (x) 3.10.1950.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 2 levels of N : $N_1=30$ and $N_2=45$ lb./ac.

(2) 3 sources of N : $S_1=F.Y.M.$, $S_2=A/S$ and $S_3=F.Y.M+A/S$.

F.Y.M. applied on 11.5.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) $5' \times 40'$. (b) 1/303 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1942—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3110 lb./ac.
(ii) 726.2 lb./ac.
(iii) None of the effects is significant
(iv) Av. yield of grain in lb./ac.

Control=2481 lb./ac.

	S_1	S_2	S_3	Mean
N_1	2730	3156	3532	3139
N_2	2837	3185	3847	3290
Mean	2783	3170	3690	3214

S.E. of marginal mean of S = 209.6 lb./ac.
S.E. of marginal mean of N = 171.2 lb./ac.
S.E. of body of table = 296.5 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 51(130).
Type :- 'M'.

Object :- To study effect of organic and inorganic manure individually and in mixture on Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.51. (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 8.10.1951.

2. TREATMENTS:

All combinations of (1) and (2) to a control.

(1) 2 levels of N : $N_1=30$ and $N_2=45$ lb./ac.

(2) 3 sources of N : $S_1=F.Y.M.$, $S_2=A/S$ and $S_3=F.Y.M.+A/S$ in 1 : 1 ratio on N basis.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2730 lb./ac.
 (ii) 943.4 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Control = 1967 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	2499	2660	2974	2711
N ₂	2682	3160	3167	3003
Mean	2591	2910	3071	2857

S.E. of marginal mean of S = 272.3 lb./ac.
 S.E. of marginal mean of N = 222.4 lb./ac.
 S.E. of body of table = 385.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 52(179)/51(130).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :—To study the residual effect of organic and inorganic manure applied to Paddy last year.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 21.5.1952 to 20.6.1952. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 8.55". (x) 5.10.1952.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 2 levels of N : N₁=30 and N₂=45 lb./ac.

(2) 3 sources of N : S₁=F.Y.M, S₂=A/S and S₃=F.Y.M.+A/S in 1 : 1 ratio on N basis.

Manures applied to previous paddy crop in 1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2814 lb./ac.
 (ii) 417.9 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control = 2584 lb./ac.

	S ₁	S ₂	S ₃	Mean
N ₁	2964	2457	2958	2793
N ₂	3040	2799	2901	2913
Mean	3002	2628	2930	2853

S.E. of marginal mean of S = 120.6 lb./ac.
 S.E. of marginal mean of N = 98.5 lb./ac.
 S.E. of body of table = 170.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 48(71).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 18.5.1948.
 (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) Nil. (v) Nil. (vi) China-972 (medium). (vii) Irrigated,
 (viii) N.A. (ix) 8.01". (x) 16.10.1948.

2. TREATMENTS :

1. 60 lb./ac. of N as F.Y.M.
2. 75 lb./ac. of N as F.Y.M.
3. 90 lb./ac. of N as F.Y.M.
4. 105 lb./ac. of N as F.Y.M.
5. 120 lb./ac. of N as F.Y.M.
6. 135 lb./ac. of N as F.Y.M.
7. 150 lb./ac. of N as F.Y.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 40' x 5'. (b) 1/358 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4260 lb./ac.
 (ii) 927.3 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3564
2.	3756
3.	4058
4.	4483
5.	4606
6.	4579
7.	4771
S.E./mean	= 378.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 49 (96).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 14.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China-972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11". (x) 29.9.1949.

2. TREATMENTS :

1. 60 lb./ac. of N as F.Y.M.
 2. 75 lb./ac. of N as F.Y.M.
 3. 90 lb./ac. of N as F.Y.M.
 4. 105 lb./ac. of N as F.Y.M.
 5. 120 lb./ac. of N as F.Y.M.
 6. 135 lb./ac. of N as F.Y.M.
 7. 150 lb./ac. of N as F.Y.M.
- Manures applied on 2.5.1949.

3. DESIGN :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/358 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 4934 lb./ac.
(ii) 337.4 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	4553
2.	4807
3.	4881
4.	4937
5.	4936
6.	5161
7.	5213
S.E./mean	= 826.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 50 (106).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 21.5.1950. (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.53". (x) 2.10.1950.

2. TREATMENTS :

1. Control (no manure).
2. 60 lb./ac. of N as F.Y.M.
3. 75 lb./ac. of N as F.Y.M.
4. 90 lb./ac. of N as F.Y.M.
5. 105 lb./ac. of N as F.Y.M.
6. 120 lb./ac. of N as F.Y.M.
7. 135 lb./ac. of N as F.Y.M.
8. 150 lb./ac. of N as F.Y.M.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Crop lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2103 lb./ac.
 (ii) 678.1 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1932
2.	1938
3.	1986
4.	2036
5.	2153
6.	2166
7.	2217
8.	2394
S.E./mean	= 276.8 lb./ac.

Crop :- Paddy (*Khariif*).

Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 51 (131)

Type :- 'M'.

Object :- To study the effect of various doses of F.Y.M. on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 28.5.1951.
 (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e)—. (v) Nil. (vi) China 972 (medium).
 (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 19.10.1951.

2. TREATMENTS :

- Control (no manure).
 - 60 lb./ac. of N as F.Y.M.
 - 75 lb./ac. of N as F.Y.M.
 - 90 lb./ac. of N as F.Y.M.
 - 105 lb./ac. of N as F.Y.M.
 - 120 lb./ac. of N as F.Y.M.
 - 135 lb./ac. of N as F.Y.M.
 - 150 lb./ac. of N as F.Y.M.
- F.Y.M. applied on 13.5.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 5'×40'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1930 lb./ac.
 (ii) 352.1 lb./ac.
 (iii) Treatments are significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1511
2.	1716
3.	1796
4.	1963
5.	2008
6.	2052
7.	2182
8.	2210
S.E./mean	= 143.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 52(183).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :—To study the residual effect of varying doses of F.Y.M. applied to Paddy last year.

1. BASAL CONDITIONS:

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Nil. (iii) 21.5.1952/23.6.1952.
 (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) N.A. (v) Nil. (vi) China 972 (medium.) (vii) Irrigated.
 (viii) N.A. (ix) 8.45". (x) 11.10.1952.

2. TREATMENTS :

1. Control (no manure).
 2. 60 lb./ac. of N as F.Y.M.
 3. 75 lb./ac. of N as F.Y.M.
 4. 90 lb./ac. of N as F.Y.M.
 5. 105 lb./ac. of N as F.Y.M.
 6. 120 lb./ac. of N as F.Y.M.
 7. 135 lb./ac. of N as F.Y.M.
 8. 150 lb./ac. of N as F.Y.M.
 F.Y.M. applied to paddy crop last year.

3. DESIGN :

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 5'×10'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS

(i) 1309 lb./ac.
 (ii) 379.0 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1140
2.	1140
3.	1159
4.	1469
5.	1419
6.	1368
7.	1431
8.	1343
S.E./mean	= 154.7 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 48(73).
Type :- 'M'.

Object :- To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow and Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 26.5.1948.
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 8.01" (x) 3.10.1948.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 level of P_2O_5 as Super : $P_0=0$, $P_1=50$ lb./ac.

(2) 3 levels of G.M. : $G_0=0$, G_1 =Lentil ploughed as G.M. at 50 lb./ac. of N and G_2 =Lentil sown for seed and harvested.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 40'×16'. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2043 lb./ac.

(ii) 284.6 lb./ac.

(iii) Main effect of G alone is highly significant.

(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	Mean
P_0	1640	2563	1825	2009
P_1	1707	2675	1845	2076
Mean	1674	2619	1835	2043

S.E. of marginal mean of P = 82.2 lb./ac.

S.E. of marginal mean of G = 100.6 lb./ac.

S.E. of body of table = 142.3 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 49(99).
Type :- 'M'.

Object :- To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS :

(i) (a) No. (b) Fallow and Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 19.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) Nil. (ix) 7.11". (x) 29.9.1949.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.

(2) 3 levels of green manure : $G_0=0$, G_1 =Lentil ploughed as G.M. at 50 lb./ac. of N and G_2 =Lentil sown for seed and harvested.

Lentil ploughed as G.M. on 8.5.1949 while Super on 4.7.1949.

3. DESIGN

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16'×40'. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

- (i) 2902 lb./ac.
 (ii) 1151.6 lb./ac.
 (iii) Only G effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	G ₀	G ₁	G ₂	Mean
P ₀	2296	3547	2614	2819
P ₁	2588	3700	2665	2984
Mean	2442	3624	2640	2902

S.E. of marginal mean of P = 332.4 lb./ac.
 S.E. of marginal mean of G = 407.1 lb./ac.
 S.E. of body of table = 575.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 50(107).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow-Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1950. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e)—. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 17.53rd. (x) 1.10.1950.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.

(2) 3 levels of green manure : G₀=0, G₁=Lentil ploughed as G.M. at 50 lb./ac. of N and G₂=Lentil sown for seed and harvested.

3. DESIGN

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16'×40'. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1951. (b) No. (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS

- (i) 2611 lb./ac.
 (ii) 337.1 lb./ac.
 (iii) G effect and interaction P×G are highly significant, while P effect is significant.

(v) Av. yield of grain in lb./ac.

	G ₀	G ₁	G ₂	Mean
P ₀	2578	3293	2469	2180
P ₁	3344	2199	1781	2441
Mean	2961	2746	2125	2611

S.E. of marginal mean of P = 97.3 lb./ac.

S.E. of marginal mean of G = 119.2 lb./ac.

S.E. of body of table = 168.6 lb./ac.

Crop :-Paddy (*Kharif*).

Ref :-J.K. 51(132).

Site :-Rice Res. Stn., Khudwani.

Type :-'M'.

Object :-To test the efficacy of green manuring with Lentil with and without Super.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) As per treatments. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 25.5.1951. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) 9.06". (x) 16.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P₂O₅ as Super : P₀=0 and P₁=50 lb./ac.(2) 3 levels of green manure : G₀=0, G₁=Lentil ploughed as G.M. at 50 lb./ac. of N and G₂=Lentil sown for seed harvested.

Lentil ploughed as G.M. on 18.5.1951 and Super applied on 7.5.1951.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16'×40'. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2080 lb./ac.

(ii) 471.4 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	G ₀	G ₁	G ₂	Mean
P ₀	1359	2281	2153	1931
P ₁	2126	2349	2209	2228
Mean	1743	2315	2181	2080

S.E. of marginal mean of P = 136.1 lb./ac.

S.E. of marginal mean of G = 166.7 lb./ac.

S.E. of body of table = 235.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 52(180).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the residual effect of green manuring with and without Super.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 20.5.1952
21.6.1952. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1007 (medium
early). (vii) Irrigated. (viii) N.A. (ix) 8.45°. (x) 8.10.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of P_2O_5 as Super : $P_0=0$ and $P_1=50$ lb./ac.(2) 3 levels of green manure : $G_0=0$, $G_1=Lentil$ ploughed as G.M. at 50 lb./ac. of N and $G_2=Lentil$
sown for seed harvested.

Lentil ploughed as G.M. on 18.5.1951 and Super on 7.5.1951 applied to paddy crop last year.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $16' \times 40'$. (b) $1/82$ ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi)
and (vii) Nil.

5. RESULTS :

(i) 2086 lb./ac.

(ii) 337.6 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	G_0	G_1	G_2	Mean
P_0	2176	2255	2070	2167
P_1	2360	1981	1676	2006
Mean	2268	2118	1873	2086

S.E. of marginal mean of P = 97.5 lb./ac.

S.E. of marginal mean of G = 119.4 lb./ac.

S.E. of body of table = 168.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 50(108).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of F.Y.M. applied alone and in combination with A/S on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1950.
(iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e). (v) Nil. (vi) China 1007 (medium early). (vii)
Irrigated. (viii) N.A. (ix) 17.53°. (x) 1.10.50.

2. TREATMENTS :

1. Control (no manure).

2. 100 lb./ac. of N as F.Y.M.

3. 100 lb./ac. of N as F.Y.M. + 15 lb./ac. of N as A/S.

4. 100 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as A/S.

5. 100 lb./ac. of N as F.Y.M. + 45 lb./ac. of N as A/S.

F.Y.M. applied on 16.5.1950 while A/S on 15.7.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 9'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) No. (iii) Grain yield. (iv) (a) 1950—1952. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2393 lb./ac.
 (ii) 466.6 lb./ac.
 (iii) Treatments are significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1962
2.	2165
3.	2420
4.	2513
5.	2904
S E./mean	= 189.4 lb./ac.

Crop :- Paddy (*Kharif*).

Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 51(133).

Type :- 'M'.

Object :- To study effect of F.Y.M. applied alone and in combination with A/S on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (iii) (a) Clayey loam. (b) N.A. (iii) 25.5.1951.
 (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 1007 (medium early.)
 (vii) Irrigated. (viii) N.A. (ix) 9.06%. (x) 16.10.1951.

2. TREATMENTS :

- Control (no manure).
 - 100 lb./ac. of N as F.Y.M.
 - 100 lb./ac. of N as F.Y.M. + 15 lb./ac. of N as A/S.
 - 100 lb./ac. of N as F.Y.M. + 30 lb./ac. of N as A/S.
 - 100 lb./ac. of N as F.Y.M. + 45 lb./ac. of N as A/S.
- F.Y.M. applied on 12.5.1951. While A/S on 16.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (ii) 6. (iv) (a) and (b) 9'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2114 lb./ac.
 (ii) 681.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1567
2.	1810
3.	2202
4.	2425
5.	2567
S.E./mean	= 278.2 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 52(181).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of F.Y.M. applied alone and in combination with A/S on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) Nil. (iii) 20.5.1952/20.6.1952. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 8.45". (x) 9.10.1952.

2. TREATMENTS :

1. Control (no manure)
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as F.Y.M.+15 lb./ac. of N as A/S.
4. 100 lb./ac. of N as F.Y.M.+30 lb./ac. of N as A/S.
5. 100 lb./ac. of N as F.Y.M.+45 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 9'×40'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2612 lb./ac.
- (ii) 722.5 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2332
2.	3191
3.	2274
4.	2478
5.	2788
S.E./mean	= 295.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 50(109).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of green manuring alone and in combination with N on Paddy.

1. BASAL CONDITIONS :

(i) Paddy-Fallow-Paddy. (b) Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1950. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 17.53". (x) 1.10.1950.

2. TREATMENTS :

1. Control (no manure).
 2. Lentil as green manure at 100 lb./ac. of N.
 3. Lentil as green manure at 100 lb./ac. of N+15 lb./ac. of N as A/S.
 4. Lentil as green manure at 100 lb./ac. of N+30 lb./ac. of N as A/S.
 5. Lentil as green manure at 100 lb./ac. of N+45 lb./ac. of N as A/S.
- Lentil ploughed as green manure on 15.5.1950 and A/S applied on 15.7.1950.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 1/12 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1694 lb./ac.
 (ii) 385.8 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1375
2.	1557
3.	1695
4.	1799
5.	2046
S.E./mean	= 157.5 lb./ac.

Crop :- Paddy (*Khari*f).

Ref :- J.K. 51 (134).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of G.M. alone and in combination with N on Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Lentil-Paddy. (b) Lentil. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 25.5.1951. (iv) (a) N.A. (b) Broadcast. (c) 60 at lb./ac. (d) and (e) —. (v) Nil. (vi) China 1007 (medium early). (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 16.10.1951.

2. TREATMENTS :

- Lentil as G.M. at 100 lb./ac. of N.
 - Lentil as G.M. at 100 lb./ac. of N+A/S at 15 lb./ac. of N.
 - Lentil as G.M. at 100 lb./ac. of N+A/S at 30 lb./ac. of N.
 - Lentil as G.M. at 100 lb./ac. of N+A/S at 45 lb./ac. of N.
 - No manure.
- Lentil ploughed on 14.5.1951 and A/S applied on 16.7.1951.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 9' x 40'. (b) 9' x 40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2096 lb./ac.
 (ii) 258.7 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1989
2.	2198
3.	2262
4.	2319
5.	1710
S.E./mean	= 105.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 52 (182).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of G.M. alone and in combination with N on Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Lentil-Paddy. (b) Lentil. (ii) (a) Clayey loam. (b) N.A. (iii) 20 and 22.5.1952
 (iv) (a) N.A. (b) Broadcast. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1007 (medium early).
 (vii) Irrigated. (viii) N.A. (ix) 8.45". (x) 9.10.1952.

2. TREATMENTS :

1. Lentil as G.M. at 100 lb./ac. of N.
2. Lentil as G.M. at 100 lb./ac. of N+A/S at 15 lb./ac. of N.
3. Lentil as G.M. at 100 lb./ac. of N+A/S at 30 lb./ac. of N.
4. Lentil as G.M. at 100 lb./ac. of N+A/S at 45 lb./ac. of N.
5. Control.

Lentil ploughed on 18.5.1952 and A/S on 19.7.1952.

3. DESIGN :

- (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 9' x 40'. (b) 9' x 40'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (b) No. (c) —. (v) (a) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1774 lb./ac.
 (ii) 475.4 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1664
2.	1785
3.	1674
4.	2168
5.	1578
S.E./mean	= 194.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 53(260).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of A/S and C/N with and without lime on yield of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953 to 6.6.1953
 (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1039 (medium early). (vii)
 Irrigated. (viii) N.A. (ix) 7.63". (x) 21.9.1953.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 levels of lime : L_0 = No lime and L_1 = Lime at 200 lb./ac.
- (2) 5 applications of N : M_0 = Control, M_1 = A/S at 20 lb./ac. of N, M_2 = A/S at 40 lb./ac. of N, M_3 =
 C/N at 20 lb./ac. of N and M_4 = C/N at 40 lb./ac. of N.

3. DESIGN :

- (i) 2 x 5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 5' x 40'. (b) 1/304 ac. (v) N.A. (vi) Yes

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953- continued. (b) No. (c) —, (v) (a) Shalimar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2850 lb./ac.
 (ii) 1676.5 lb /ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	L ₀	L ₁	Mean
M ₀	2356	2533	2445
M ₁	2736	2787	2762
M ₂	3040	3395	3217
M ₃	2685	2787	2736
M ₄	2939	3243	3091
Mean	2751	2949	2850

S.E. of marginal mean of M = 484.0 lb./ac.
 S.E. of marginal mean of L = 306.1 lb./ac.
 S.E. of body of table = 684.4 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 48(70).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :- To study the effect of varying doses of N in the form of Oilcake.

1. BASAL CONDITIONS :

(i) (a) Paddy Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 23.5.1948. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) 19.10.1948.

2. TREATMENTS :

1. Control (no manure).
 2. 20 lb./ac. of N as oilcake.
 3. 40 lb./ac. of N as oilcake.
 4. 60 lb./ac. of N as oilcake.
- Oilcake applied on 3.7.1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 40' x 4'. (b) 1/382 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1944 to 1948. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2677 lb./ac.
 (ii) 307.1 lb./ac.
 (iii) Treatments are highly significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2081
2.	2754
3.	2777
4.	3096
S.E./mean	= 125.4 lb./ac.

Crop :- Paddy (*Kharif*)

Ref :- J.K. 49(95)/48(70).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :—To study the residual effect of varying doses of N in the form of Oilcake.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 15.4.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11^r. (x) 29.9.1949.

2. TREATMENTS :

- Control (no manure)
- 20 lb./ac. of N as oilcake.
- 40 lb./ac. of N as oilcake.
- 60 lb./ac. of N as oilcake.

Manures applied in 1948.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 4'×40'. (b) 1/382 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) No. (iii) Grain yield. (iv) (a) 1949-1950. (b) Yes. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3746 lb./ac.

(ii) 766.9 lb./ac.

(iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3243
2.	3557
3.	4031
4.	4154
S.E./mean	= 313.1 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 50(105)/49(95)/48(70).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :—To study the residual effect of varying doses of N in the form of Oilcake.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 21.5.1950 (iv) (a) N.A. (b) Broadcast. (c) 60 lb./ac. (d) and (e)—. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 17.53^r. (x) 2.10.1950.

2. TREATMENTS :

1. Control (no manure):
 2. 20 lb./ac. of N as oilcake.
 3. 40 lb./ac. of N as oilcake.
 4. 60 lb./ac. of N as oilcake.
- Applied to the crop in 1949.

3. DESIGN :

- (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 4'×40'. (b) 1/332 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1949-1950. (b) Yes. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2672 lb./ac.
 (ii) 653.9 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2583
2.	2635
3.	2594
4.	2877
S.E./mean	= 266.9 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 48(69).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :—To compare the effect of different manures at two levels of N applied to Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 23.5.1948. (iv) (a) and (b) N.A. (c) Broadcast. (d) and (e)—. (v) Nil. (vi) China 972 (medium), (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) 10.10.1948.

2. TREATMENTS :

All combinations of (1) and (2)+a control.

- (1) 2 levels of N : $N_1=75$ and $N_2=90$ lb./ac.

- (2) 5 sources of N : $S_1=F.Y.M.$, $S_2=A/S$, $S_3=Lentil (G.M.)$, $S_4=Oilcake$ and $S_5=F.Y.M.+A/S$.

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 40'×5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1948-1949. (b) Yes. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1642 lb./ac.
 (ii) 341.3 lb./ac.
 (iii) Effect of sources and interaction source × level are significant. Effect of N is not significant.

(iv) Av. yield of grain in lb./ac.

Control=1292 lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean
N ₁	1786	1292	2071	1387	1482	1604
N ₂	2090	1235	2204	1416	1805	1750
Mean	1938	1264	2138	1401	1643	1677

S.E. of marginal mean of S	=120.7 lb./ac.
S.E. of marginal mean of N	= 76.3 lb./ac.
S.E. of body of table	=170.7 lb./ac.
S.E. of "control vs other" treatment means	=179.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 49(94)/48(69).

Site :- Rice Res. Stn., Khudwani.

Type :- 'M'.

Object :—To compare the residual effect of different manures at two levels of N.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 18.5.1949. (iv) (a) and (b) N.A. (c) Broadcast. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11^c. (x) 1.10.1949.

2. TREATMENTS :

All combinations of (1) and (2) + a control.

(1) 2 levels of N : N₁=75 and N₂=90 lb./ac.(2) 5 sources of N : S₁=F.Y.M., S₂=4/S, S₃=Lentil (G.M.), S₄=Oilcake and S₅=F.Y.M.+A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 40' x 5'. (b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1948-1949. (b) Yes. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3452 lb./ac.

(ii) 663.7 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

Control=3292 lb./ac.

	S ₁	S ₂	S ₃	S ₄	S ₅	Mean
N ₁	3548	3040	3610	3382	3468	3410
N ₂	3615	3130	3976	3401	3510	3526
Mean	3582	3085	3793	3392	3489	3468

S.E. of marginal mean of S	=234.7 lb./ac.
S.E. of marginal mean of N	=148.4 lb./ac.
S.E. of body of table	=331.8 lb./ac.
S.E. of "control vs other" treatment means	=348.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 53(261).

Site :- Prov. Agri. Farm, Shalimar.

Type :- M'.

Object :- To study the effect of A/S and C/N on yield of Paddy with and without lime.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953/6.6.1953. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) China 1039 (medium). (vii) Irrig ted. (viii) N.A. (ix) 7.63". (x) 11.9.1953.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.(2) 5 applications of N : $N_0=0$, $N_1=20$ lb./ac. of N as A/S, $N_2=40$ lb./ac. of N as A/S, $N_3=20$ lb./ac. of N as C/N and $N_4=40$ lb./ac. of N as C/N.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/311 ac. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—continued. (b) No. (c) —. (v) (a) Khudwani. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 3273 lb./ac.

(ii) 682.6 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N_0	N_1	N_2	N_3	N_4	Mean
L_0	2879	3259	3385	3119	3385	3205
L_1	2986	3372	3759	3186	3399	3340
Mean	2933	3316	3572	3153	3392	3273

S.E. of marginal mean of L = 124.6 lb./ac.

S.E. of marginal mean of N = 197.0 lb./ac.

S.E. of body of table = 278.7 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 53(259).

Site :- Rice Res. Stn., Khudwani.

Type :- 'MV'.

Object :- To study the effect of A/S and F.Y.M. on yield of different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953/7.6.1953. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.63". (x) 21.9.1953.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =China 1039 and V_3 =*Budgi* local.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 4 levels of N as A/S : $N_0=0$, $N_1=20$, $N_2=40$ and $N_3=60$ lb./ac. of N.(2) 4 applications of F.Y.M. : F_1 =Pitted F.Y.M. at 125 md./ac., F_2 =Pitted F.Y.M. at 250 md./ac., F_3 =Exposed F.Y.M at 125 md./ac. and F_4 =Exposed F.Y.M. at 250 md./ac.

3. DESIGN:

(i) Split-plot, (ii) (a) 2 main-plots/block ; 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 50'×4'.
(b) 1/304 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1953—continued. (b) No. (c) —. (v) (a) No. (b) Nil.
(vi) and (vii) Nil.

5. RESULTS :

- (i) 5084 lb./ac.
(ii) (a) 718.1 lb./ac.
(b) 608.5 lb./ac.
(iii) Varieties are highly significantly different. F.Y.M. as well as N effects are highly significant while others are not significant.
(iv) Av. yield of grain in lb./ac.

	F ₁	F ₂	F ₃	F ₄	Mean	N ₀	N ₁	N ₂	N ₃
V ₁	5127	6351	4843	6198	5630	4244	5518	5941	6817
V ₂	4104	5397	3856	4798	4539	4104	4309	5013	5729
Mean	4615	5874	4350	5498	5084	3674	4914	5477	6273
N ₀	3120	4521	2743	4312					
N ₁	4553	5557	4371	5172					
N ₂	5036	6267	4847	5759					
N ₃	5752	7153	5439	6749					

S.E. of difference of two

1. Marginal means of V = 146.6 lb./ac.
2. Marginal means of N = 175.6 lb./ac.
3. N or F means at the same level of V = 284.4 lb./ac.
4. V means at the same level of N or F = 260.3 lb./ac.
5. S.E. of body of N×F table = 248.5 lb./ac.

Crop :- Paddy (*Kharif*).

Site :- Prov. Agri. Farm, Shalimar.

Ref :- J. K. 53(262).

Type :- 'MV'.

Object :- To study the effect of A/S and Super on yield of different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 2.3.1953/6.6.1953.
(iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.63". (x) 6.9.1953.

2. TREATMENTS :

All combinations of (1), (2) and (3)

- (1) 3 varieties : V₁=China 1039, V₂=*Begum* and V₃=*Lulzan*.
- (2) 3 levels of N as A/S : N₀=0, N₁=30 and N₂=60 lb./ac.
- (3) 3 levels of P₂O₅ as Super : P₀=0, P₁=30 and P₂=60 lb./ac.

3. DESIGN :

(i) 3³ Fact. Conf. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 2. (iv) (a) 5'×30'.
(b) 5'×28'. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3079 lb./ac.
 (ii) 698.4 lb/ac.
 (iii) Only N effect is significant.
 (iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean	P ₀	P ₁	P ₂
N ₀	2934	2614	2667	2738	2560	2667	2987
N ₁	3467	2907	2907	3094	2747	3147	3387
N ₂	3574	3440	3200	3405	3174	3494	3547
Mean	3325	2987	2925	3079			
P ₀	2934	2934	2614	2827			
P ₁	3440	3040	2827	3103			
P ₂	3600	2987	3334	3307			

S.E. of any marginal mean = 164.4 lb./ac.
 S.E. of body of any table = 285.2 lb./ac.

Crop :- Paddy (*Kharif*).

Site :- Prov. Agri. Farm, Shalimar.

Ref :- J.K. 53(263).

Type :- 'MV'.

Object :—To study the effect of A/S and F.Y.M. on yield of different varieties of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 2.5.1953/7.6.1953.
 (iv) (a) N.A. (b) Transplanted. (c) —. (d) 9"×9". (e) 4. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.63". (x) 12.9.1953.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V₁=China 1039 and V₂=*Begum basmati* 370.

Sub-plot treatment :

All combinations of (1) and (2)

(1) 4 levels of N : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.

(2) 4 doses of F.Y.M. : F₁=125 md./ac. as pitted F.Y.M., F₂=250 md./ac. as pitted F.Y.M., F₃=125 md./ac. as exposed F.Y.M. and F₄=250 md./ac. as exposed F.Y.M.

F.Y.M. applied on 3.6.1953 while N as A/S applied on 25.5.1953.

3. DESIGN :

- (i) Split-plot. (ii) (a) 2 main-plots/block : 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5'×30'. (b) 5'×30'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953-continued. (b) No. (c) Nil. (v) (a) Khudwani (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

- (i) 2614 lb./ac.
(ii) (a) 1213.1 lb./ac.
(b) 540.2 lb./ac.
(iii) F effect is significant, N effect is highly significant while others are not significant.
(iv) Av. yield of grain in lb./ac.

	F ₁	F ₂	F ₃	F ₄	Mean	V ₁	V ₂
N ₀	2439	2365	1805	2329	2234	2464	2004
N ₁	2464	2738	2240	2514	2490	2701	2278
N ₂	2688	2863	2638	2688	2720	2950	2489
N ₃	2962	3385	2863	2382	3012	3317	2707
Mean	2639	2838	2387	2592	2614	2858	2370
V ₁	2794	3167	2663	2807			
V ₂	2483	2508	2110	2377			

S.E. of difference of two

1. Marginal means of V = 247.6 lb./ac.
2. Marginal means of N or F = 156.0 lb./ac.
3. Means in the body of N×F table = 311.9 lb./ac.
4. N or F means at the same level of V = 220.5 lb./ac.
5. V means at the same level of N or F = 312.7 lb./ac.

Crop :- Paddy (Kharif).
Site :- Agri. Farm, Kawa.

Ref :- J.K. 52(178).
Type :- 'C'.

Object :- To study the effect of cultural practices on yield of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey. (b) N.A. (iii) 1.6.1952/11.7.1952. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) China 1007 (medium). (vii) Irrigated. (viii) 2-3 hoeings. (ix) N.A. (x) 22.10.1952.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) Plant to plant spacings : D₁=3", D₂=6" and D₃=9".
- (2) Seedlings/hole : S₁=2, S₂=4 and S₃=6 seedlings/hole.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 3'×24'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3585 lb./ac.
- (ii) 1049.5 lb./ac.
- (iii) Only S effect is significant.

(iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean
D ₁	4033	3227	3630	3630
D ₂	4033	3227	2823	3361
D ₃	5243	2823	3227	3764
Mean	4436	3092	3227	3585

S.E. of any marginal mean = 349.8 lb./ac.
 S.E. of body of table = 605.9 lb./ac.

Crop :- Paddy (*Kharif*).
 Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 48(72).
 Type :- 'C'.

Object :- To test the efficacy of different cultural treatments after first weeding.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 25.5.1948. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) Weeding on 29.6.1948. (ix) 8.01". (x) 15.10.1948.

2. TREATMENTS :

1. *Heji* (ploughing with local plough without iron tip) after 1st weeding.
 2. Cattle treading after 1st weeding.
 3. No treatment after 1st weeding.

3. DESIGN .

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 40' × 10'. (b) 1/143 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1948. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1927 lb./ac.
 (ii) 145.3 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2130
2.	2053
3.	1597
S.E./mean	= 59.3 lb./ac.

Crop :- Paddy (*Kharif*).
 Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 49(97).
 Type :- 'C'.

Object .—To test the efficacy of different cultural treatments after first weeding.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 21.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) Weeding on 19.6.1949. (ix) 7.11". (x) 4.10.1949.

2. TREATMENTS :

1. *Heji* (ploughing with local plough without iron tip) after 1st weeding.
2. Cattle treading after 1st weeding.
3. No treatment after 1st weeding.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 40' x 10'. (v) 1/143 ac. (vi) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1949. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3683 lb./ac.
- (ii) 219.5 lb./ac.
- (iii) Treatments are highly significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	4110
2.	4092
3.	2848
S.E./mean	= 89.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 49(98).

Site :- Rice Res. Stn. Khudwani.

Type :- 'C'.

Object :—To test the efficiency of different treatments after weeding over the control.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) (a) Clayey loam. (b) N.A. (iii) 16.5.1949. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) China 972 (medium). (vii) Irrigated. (viii) N.A. (ix) 7.11". (x) 2.10.1949.

2. TREATMENTS :

1. Paddy after oilseed crop (rape).
2. Paddy after Fallow (ploughing in autumn).
3. Paddy after Fallow (no cultivation in winter).
4. Paddy after Lentil (green manure).

3. DESIGN

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 8' x 50'. (b) 1/110 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c)—. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS

- (i) 3233 lb./ac.
- (ii) 255.0 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	3152
2.	3247
3.	3187
4.	3344
S.E./mean	= 104.1 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Agri. Farm, Rajhani.

Ref :- J.K. 52 (177).
Type :- 'C'.

Object :- To study the effect of different spacings and seedlings/hill on yield of Paddy.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 10.7.1952. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) *Basmati* 370 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 27.10.1952.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) Seedlings/hill : $S_1=2$, $S_2=4$, $S_3=6$ and $S_4=8$ seedlings/hill.
(2) 3 plant to plant spacings : $D_1=3'$, $D_2=6'$ and $D_3=9'$.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $5' \times 35'$. (b) $5' \times 35'$. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1064 lb./ac.
(ii) 133.2 lb./ac.
(iii) Only $S \times D$ interaction is highly significant.
(iv) Av. yield of grain in lb./ac.

	D_1	D_2	D_3	Mean
S_1	1035	1143	1058	1079
S_2	1159	739	1089	996
S_3	1190	1120	1050	1120
S_4	1105	1073	1011	1063
Mean	1122	1019	1052	1064

S.E. of marginal mean of S = 38.4 lb./ac.
S.E. of marginal mean of D = 33.3 lb./ac.
S.E. of body of table = 66.6 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 48 (74).
Type :- 'CV'.

Object :- To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) 17.10.1948.

2. TREATMENTS

All combinations of (1) and (2)

- (1) 2 varieties : $V_1=China$ 972 and $V_2=China$ 988.
(2) 6 methods of planting : $M_1=Broadcast$ on 23.5.1948, $M_2=Broadcast$ on 2.6.1948, $M_3=Broadcast$ on 12.6.1948, $M_4=Transplanted$ by local method on 20.5.1948, $M_5=Transplanted$ by local method on 27.5.1948 and $M_6=Transplanted$ by local method on 3.6.1948.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 32'×5.5'. (b) 1/312 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1798 lb./ac.
 (ii) 615.8 lb./ac.
 (iii) Only M effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean
V ₁	2438	1970	1170	1970	1619	1443	1768
V ₂	2496	2145	1453	1970	1550	1346	1827
Mean	2467	2058	1312	1970	1585	1395	1798

S.E. of marginal mean of V = 125.7 lb./ac.
 S.E. of marginal mean of M = 217.7 lb./ac.
 S.E. of body of table = 307.9 lb./ac.

Crop :- Paddy (*Khari*).
 Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 49(100).
 Type :- 'CV'.

Object :- To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.11". (x) 18.10.1949.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 varieties : V₁=China 972 and V₂=China 1007.

(2) 6 methods of planting : M₁=Broadcast on 19.5.1949, M₂=Broadcast on 29.5.1949, M₃=Broadcast on 8.6.1949, M₄=Transplanted on 18.6.1949, M₅=Transplanted on 25.6.1949 and M₆=Transplanted on 2.7.1949.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5.5'×32'. (b) 1/312 ac. (b) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. Information on lodging N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3411 lb./ac.
 (ii) 295.5 lb./ac.
 (iii) Both V and M effects are highly significant while interaction is not significant.

(iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean
V ₁	3842	3413	2818	3608	3286	2730	3283
V ₂	4339	3783	3062	3842	3422	2779	3538
Mean	4091	3598	2940	3725	3354	2755	3411

S.E. of marginal mean of V = 60.3 lb./ac.

S.E. of marginal mean of M = 104.5 lb./ac.

S.E. of body of table = 147.8 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 50(110).

Site :- Rice Res. Stn., Khudwani.

Type :- 'CV'.

Object :—To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments.
 (iv) (a) N.A. (b) As per treatments. (c) —. (d) and (e) N.A. (v) Nil. (vi) As per treatment. (vii) Irrigated. (viii) N.A. (ix) 17.53". (x) 11.10.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V₁=China 972 and V₂=China 988.(2) 6 methods of planting : M₁=Broadcast on 21.5.1950, M₂=Broadcast on 31.5.1950, M₃=Broadcast on 10.6.1950, M₄=Transplanted on 16.6.1950, M₅=Transplanted on 23.6.1950 and M₆=Transplanted on 30.6.1950.

3. DESIGN :

(i) R.B.D. Factorial. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5½' × 32'. (b) 1/312 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1898 lb./ac.

(ii) 1107.1 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	Mean
V ₁	1853	1726	1443	1755	1570	1536	1647
V ₂	2447	2204	2174	2228	2135	1697	2148
Mean	2150	1965	1809	1992	1853	1617	1898

S.E. of marginal mean of V = 226.0 lb./ac.

S.E. of marginal mean of M = 391.4 lb./ac.

S.E. of body of table = 553.6 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 51(135).

Site :- Rice Res. Stn., Khudwani.

Type :- 'CV'.

Object :-To compare broadcast and transplanting methods with different Chinese varieties of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) N.A. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 22.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 varieties :
- V_1
- =China 972 (medium) and
- V_2
- =China 988 (medium).

- (2) 6 methods of planting :
- M_1
- =Broadcast on 18.5.1951,
- M_2
- =Broadcast on 28.5.1951,
- M_3
- =Broadcast on 7.6.1951.,
- M_4
- =Transplanted by local method on 20.5.1951,
- M_5
- =Transplanted by local method on 27.5.1951 and
- M_6
- =Transplanted by local method on 3.6.1951.

3. DESIGN :

- (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5.5'×32'. (b) 1/312 ac. (v) N.A. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1947—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1165 lb./ac.
 (ii) 220.8 lb./ac.
 (iii) Main effect of M alone is highly significant.
 (iv) Av. yield of grain in lb./ac.

	M_1	M_2	M_3	M_4	M_5	M_6	Mean
V_1	1550	1214	795	1409	1204	707	1147
V_2	1701	1238	707	1492	1229	731	1183
Mean	1626	1226	751	1451	1217	719	1165

S.E. of marginal mean of V = 45.1 lb./ac.
 S.E. of marginal mean of M = 78.1 lb./ac.
 S.E. of body of table = 110.4 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 48(75).

Site :- Rice Res. Stn., Khudwani.

Type :- 'CV'.

Object :-To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS :

- (i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 24.5.1948. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 8.01". (x) V_1 =29.9.1948 and V_2 =10.10.1948.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 varieties :
- V_1
- =China 972 and
- V_2
- =
- Budgi*
- (local high yielder).

- (2) 4 seed rates :
- R_1
- =48,
- R_2
- =60,
- R_3
- =72 and
- R_4
- =84 lb./ac.

3. DESIGN :

(i) Factorial in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $40\frac{1}{2}' \times 19'$. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1542 lb./ac.
 (ii) 253.2 lb./ac.
 (iii) R effect is highly significant, V effect is significant while interaction $V \times R$ is not significant.
 (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	R ₄	Mean
V ₁	1700	1807	1950	1874	1833
V ₂	1163	1170	1432	1239	1251
Mean	1432	1489	1691	1557	1542

S.E. of marginal mean of V = 63.3 lb./ac.
 S.E. of marginal mean of R = 89.5 lb./ac.
 S.E. of body of table = 126.6 lb./ac.

Crop :- Paddy (*Khari*).

Ref :- J.K. 49(101).

Site :- Rice Res. Stn , Khudwani.

Type :- 'CV'.

Object :—To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 12.5.1949. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 7.11^r. (x) V₁=9.10.1949 and V₂=1.10.1949.

2. TREATMENTS :

All combinations of (1) and (2)

- (1) 2 varieties : V₁=China 972 and V₂=*Budgi* (local high yielder).
 (2) 4 seed rates : R₁=48, R₂=60, R₃=72 and R₄=84 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) $40.5' \times 9'$. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1877 lb./ac.
 (ii) 553.4 lb./ac.
 (iii) V effect alone is highly significant.

(iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	R ₄	Mean
V ₁	1929	2227	2718	2615	2372
V ₂	1247	1327	1525	1424	1381
Mean	1588	1777	2122	2020	1877

S.E. of marginal mean of V = 138.4 lb./ac.
 S.E. of marginal mean of R = 195.7 lb./ac.
 S.E. of body of table = 276.7 lb./ac.

Crop :- Paddy (*Kharif*).
 Site :- Rice Res. Stn., Khudwani.

Ref :- J.K. 50(111).
 Type :- 'CV'.

Object :—To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 19.5.1950. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 17.53". (x) V₁=13.10.1950 and V₂=2.10.1950.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 varieties : V₁=China 972 and V₂=*budgi* (local high yielder).
 (2) 4 seed rates : R₁=48, R₂=60, R₃=75 and R₄=84 lb./ac.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 19'×40.5'. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1947—1951. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

(i) 1827 lb./ac.
 (ii) 354.6 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	R ₄	Mean
V ₁	1666	1883	2160	1958	1917
V ₂	1533	1651	1914	1845	1736
Mean	1600	1767	2037	1902	1827

S.E. of marginal mean of V = 81.1 lb./ac.
 S.E. of marginal mean of R = 114.8 lb./ac.
 S.E. of body of table = 162.3 lb./ac.

Crop :-Paddy (*Kharif*).

Ref :-J.K. 51(136).

Site :-Rice Res. Stn., Khudwani.

Type :-'CV'.

Object :-To determine the proper seed rate for two different varieties of Paddy.

1. BASAL CONDITIONS

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 12.6.1951. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 29.10.1951 (China 1039) and 18.10.1951 (*Budgi*).

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1 =China 1039 and V_2 =*Budgi* (Local high yielder.)(2) 4 seed rates : R_1 =48, R_2 =60, R_3 =72 and R_4 =84 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 19'×40.5'. (b) 1/61 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1947—1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 569.0 lb./ac.

(ii) 161.6 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
V_1	550.0	573.8	643.4	574.7	585.5
V_2	502.3	559.5	593.8	554.7	552.6
Mean	526.1	566.7	618.6	564.7	569.0

S.E. of marginal mean of V =40.40 lb./ac.

S.E. of marginal mean of R =57.13 lb./ac.

S.E. of body of table =80.80 lb./ac.

Crop :-Paddy (*Kharif*).

Ref :-J.K. 51(137).

Site :-Rice Res. Stn., Khudwani.

Type :-'CV'.

Object :-To study the effect of spacing on yield of Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy—Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 25.5.1951/24.6.1951. (iv) (a) N.A. (b) Transplanting. (c) —. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.06". (x) 18.10.1951.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1 =China 1039 and V_2 =*Begum*.(2) 3 spacings : S_1 =3'×3', S_2 =6'×6" and S_3 =9'×9".

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 6'×32'. (b) 1/227 ac. (v) N.A. (vi) Yes.

4- GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5, RESULTS :

(i) 1501 lb./ac.
 (ii) 516.9 lb./ac.
 (iii) S and V effects are highly significant while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean
V ₁	2104	1901	1315	1773
V ₂	1740	1121	823	1228
Mean	1922	1511	1069	1501

S.E. of marginal mean of S = 149.2 lb./ac.
 S.E. of marginal mean of V = 121.8 lb./ac.
 S.E. of body of table = 211.0 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :-J.K. 50(112).

Site :- Rice Res. Stn., Khudwani.

Type :- 'CV'.

Object :-To study the effect of spacing on yield of Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 18,19.6.1950. (iv) (a) N.A. (b) Transplanting. (c) —. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 17.53". (x) 13.10.1950.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V₁=China 1039 and V₂=*Begun*.
 (2) 3 spacings : S₁=3"×3", S₂=6"×6" and S₃=9"×9".

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 6'×32'. (b) 1/227 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-1951. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1519 lb./ac.
 (ii) 382.9 lb./ac.
 (iii) S effect alone is highly significant.
 (iv) Av. yield of grain in lb./ac.

	S ₁	S ₂	S ₃	Mean
V ₁	1958	1561	1156	1558
V ₂	1778	1516	1142	1479
Mean	1868	1539	1149	1519

S.E. of marginal mean of V = 90.3 lb./ac.
 S.E. of marginal mean of S = 110.5 lb./ac.
 S.E. of body of table = 156.3 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 52(184).

Site :- Prov. Agri. Farm, Shalimar.

Type :- 'CV'.

Object :—To study the effect of number of seedlings and spacing on yield of different Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 23.4.1952/16.6.1952.
 (iv) (a) N.A. (b) Transplanting. (c)—. (d) and (e) As per treatments. (v) N.A. (vi) As per treatments.
 (vii) Irrigated. (viii) N.A. (ix) 8.45°. (x) 11.9.1952.

2. TREATMENTS :

Main-plot treatments :

2 varieties : V_1 =China 1039 (medium) and V_2 =*Begum basmati* 370.

Sub-plot treatments :

All combinations of (1) and (2)

(1) 3 spacings : $S_1=3'' \times 3''$, $S_2=6'' \times 6''$ and $S_3=9'' \times 9''$.(2) No. seedlings/hill : $H_1=2$, $H_2=4$, $H_3=6$ and $H_4=8$ seedling/hill.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/block ; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30' x 5'. (b) 28' x 5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 2153 lb./ac.
 (ii) (a) 1072.5 lb./ac.
 (b) 465.3 lb./ac.
 (iii) Only S effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	H_1	H_2	H_3	H_4	Mean	V_1	V_2
S_1	2479	2616	2334	2518	2487	2382	2591
S_2	2149	2178	2110	2095	2134	2083	2184
S_3	1843	1804	1760	1954	1840	1830	1850
Mean	2157	2200	2068	2190	2154	2098	2208
V_1	2155	1971	2068	2201			
V_2	2159	2428	2068	2178			

S.E. of difference of two

1. Marginal means of V =218.9 lb./ac.
2. Marginal means of H =134.3 lb./ac.
3. Marginal means of S =116.3 lb./ac.
4. means in S x H table =232.6 lb./ac.
5. H means at the same level of V =189.9 lb./ac.
6. V means at the same level of H =273.8 lb./ac.
7. S means at the same level of V =164.5 lb./ac.
8. V means at the same level of S =256.8 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Prov. Agri. Farm, Shalimar.

Ref :- J.K. 52(185).
Type :- 'CV'.

Object :- To find out the best seed rate for different Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 28.4.1952.
(iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) N.A. (vi) As per treatments.
(vii) Irrigated. (viii) N.A. (ix) 8.45". (x) 12.9.1952.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : V_1 = China 1039 and V_2 = *Begum*.
(2) 4 seed rates : R_1 = 48, R_2 = 60, R_3 = 72 and R_4 = 84 lb./ac.

3. DESIGN :

(i) Fact in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 30' × 6'. (b) 30' × 6'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No.
(b) Nil. (vi) Nil. (vii) Seeds were soaked on 23.4.1952.

5. RESULTS :

(i) 1182 lb./ac.
(ii) 351.3 lb./ac.
(iii) Only V effect is significant.
(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	Mean
V_1	1376	1021	1384	1528	1327
V_2	1089	809	1225	1021	1036
Mean	1233	915	1305	1275	1182

S.E. of marginal mean of R = 124.2 lb./ac.
S.E. of marginal mean of V = 87.8 lb./ac.
S.E. of body of table = 175.7 lb./ac.

Crop :- Paddy (*Kharif*).
Site :- Prov. Agri. Farm, Shalimar.

Ref :- J.K. 52(187).
Type :- 'CV'.

Object :- To study the effect of sowing by broadcast and transplanting on yield of different Paddy varieties.

1. BASAL CONDITIONS:

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) 2 C.L. F.Y.M./replication. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 3.45". (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 varieties : V_1 = China 1039 (medium) and V_2 = *Begum* (medium).

(2) 10 dates of broadcasting and transplanting :— D_1 = 31.12.2009, D_2 = 7.1.2010, D_3 = 14.1.2010,
 D_4 = 21.1.2010, D_5 = 28.1.2010, D_6 = 7.2.2010, D_7 = 14.2.2010, D_8 = 21.2.2010, D_9 = 29.2.2010 and
 D_{10} = 3.3.2010.

D_1 to D_5 as broadcast and D_6 to D_{10} by transplantings. Dates are according to *Bikarmi Samvat*

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) 5'×30'. (b) 5'×28'. (v) 1' on each side along breadth. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1899 lb./ac.
 (ii) 440.2 lb./ac.
 (iii) Only V effect is highly significant.
 (iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	Mean
V ₁	2110	2168	2324	2022	1925	2120	2139	2564	2178	1974	2162
V ₂	1964	1789	1420	1672	1152	2022	1906	1332	1663	1429	1635
Mean	2037	1979	1872	1847	1539	2071	2023	1998	1921	1702	1899

S.E. of marginal mean of V = 69.60 lb./ac.

S.E. of marginal mean of D = 155.64 lb./ac.

S.E. of body of table = 220.10 lb./ac.

Crop :- Paddy (*Kharif*).

Ref :- J.K. 53 (267).

Site :- Provincial Agri. Farm, Shalimar.

Type :- 'CMV'.

Object :- To study the effect of spacing, no. of seedlings and application of F.Y.M. on yield of Paddy varieties.

1. BASAL CONDITIONS :

(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 2.5.1953/8.6.1953. (iv) (a) N.A. (b) Transplanted. (c) —. (d) and (e) As per treatments. (viii) N.A. (ix) 7.63". (x) 13.9.1953.

2. TREATMENTS :

All combinations of (1), (2), (3) and (4)

(i) 3 varieties : V₁=China 1039, V₂=*Be gum basmati* 370 and V₃=*Lolazan* (local).

(2) 3 plant to plant spacings : D₁=6", D₂=8" and D₃=10".

(3) No. seedlings/hill : S₁=2, S₂=4 and S₃=6.

(4) 3 levels of F.Y.M. : M₁=125, M₂=250 and M₃=375 md./ac.

3. DESIGN :

(i) 3³ confounded. (ii) (a) 3 blocks/replication ; 9 plots/block. (b) N.A. (iii) 2. (iv) (a) 5'×30'. (b) 5'×28'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953—continued. (b) No. (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1168 lb./ac.
 (ii) 228.0 lb./ac.
 (iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	D ₁	D ₂	D ₃	M ₁	M ₂	M ₃	S ₁	S ₂	S ₃	Mean
V ₁	1223	1061	1167	1206	1076	1169	1175	1203	1072	1150
V ₂	1260	1165	1262	1210	1247	1229	1186	1286	1214	1229
V ₃	1149	1143	1087	1119	1111	1149	1089	1119	1171	1126
Mean	1211	1123	1172	1178	1145	1182	1150	1203	1152	1168
S ₁	1175	1113	1162	1139	1165	1147				
S ₂	1314	1130	1165	1258	1134	1216				
S ₃	1143	1126	1188	1139	1134	1184				
M ₁	1212	1145	1178							
M ₂	1245	1044	1145							
M ₃	1175	1180	1193							

S.E. of any marginal mean
S.E. of body of any tables

=31.0 lb./ac.
=53.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 53 (264).

Site :- Prov. Agri. Farm, Shalimar.

Type :- 'M'.

Object :—To study the effect of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 9.11.1953. (iv) (a) and (b) Broadcast. (c) N.A. (d) and (e)—. (v) Nil. (vi) NP/4 (medium). (vii) Irrigated. (viii) N.A. (ix) 9.21". (x) 20.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources of N : S₁=C/N and S₂=A/S.(2) 5 levels of N : N₁=20, N₂=40, N₃=60, N₄=80 and N₅=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 5'×30'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No (b) Nil. (vi) Nil. (vii) *Sarson* was also sown mixed with wheat but only yield of wheat is available.

5. RESULTS :

(i) 796.2 lb./ac.

(ii) 369.94 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	N ₃	N ₄	N ₅	Mean
S ₁	784.1	812.1	504.1	952.1	821.4	974.8
S ₂	896.1	616.1	896.1	952.1	728.1	817.7
Mean	840.1	714.1	700.1	952.1	774.8	796.2

S.E. of marginal mean of N
S.E. of marginal mean of S
S.E. of body of table

=130.80 lb./ac.
= 82.72 lb./ac.
=184.97 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 53(266).

Site :- Prov. Agri. Farm, Shalimar.

Type :- 'M'.

Object :- To study best manurial formula for Wheat crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 10.11.1953. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) NP-4 (medium). (vii) Unirrigated. (viii) N.A. (ix) 9.21". (x) 20.5.1954.

2. TREATMENTS :

1. Control (no manure).
2. 100 md/ac. of F.Y.M.
3. 200 md/ac. of F.Y.M.
4. 40 lb./ac. of N as A/S.
5. 80 lb./ac. of N as A/S.
6. 40 lb./ac. of N as C/N.
7. 80 lb./ac. of N as C/N.
8. 50 md/ac. of F.Y.M. + 20 lb./ac. of N as A/S.
9. 100 md/ac. of F.Y.M. + 40 lb./ac. of N as A/S.
10. 50 md/ac. of F.Y.M. + 20 lb./ac. of N as C/N.
11. 100 md/ac. of F.Y.M. + 40 lb./ac. of N as C/N.
12. 100 md/ac. as Dal lake weed.
13. 200 md/ac. as Dal lake weed.

3. DESIGN :

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 30' × 5'. (b) 30' × 5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) *Sarson* was sown mixed with wheat but yield of only wheat is available.

5. RESULTS :

- (i) 898 lb./ac.
 (ii) 294.1 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	523	8.	859
2.	747	9.	971
3.	821	10.	859
4.	1008	11.	896
5.	1307	12.	691
6.	1027	13.	728
7.	1232		

S.E./mean = 147.1 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 53(257).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'M'.

Object :- To study effect of application of A/S and C/N with and without lime on wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) N.A. (ii) (a) Loamy type. (b) N.A. (iii) 13.8.2010 (*Vikrami Samvat*). (iv) (a) N.A. (b) *Kera*. (c) 32 sr/ac. (d) 9" row to row. (e) —. (v) Nil. (vi) NP-4 medium. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2).

- (1) 2 levels of lime : $L_0=0$ and $L_1=200$ lb./ac.
- (2) 5 applications of N : $N_0=0$, $N_1=20$ lb./ac. of N as A/S, $N_2=40$ lb./ac. of N as A/S, $N_3=20$ lb./ac. of N as C/N and $N_4=40$ lb./ac. of N as C/N.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/16 ac. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Poor. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 560.2 lb./ac.
 (ii) 119.07 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	N ₀	N ₁	N ₂	N ₃	N ₄	
L ₀	574.6	526.6	592.5	523.9	570.5	557.6
L ₁	482.7	603.4	652.8	471.8	603.4	562.8
Mean	528.7	565.0	622.7	497.9	587.0	560.2

S.E. of marginal mean of L = 21.74 lb./ac.
 S.E. of marginal mean of N = 34.37 lb./ac.
 S.E. of body of table = 48.61 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 5 2(167).

Site :- Central Prov. Agri. Exptl. Farm Talab Tiloo, Jammu. Type :- 'M'.

Object :- To study the effect of varying doses of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 12.8.2008. (*Vikrami Samvat*)
 (iv) (a) N.A. (b) By *keri*. (c) 32 sr./ac. (d) 8' row to row. (e) —. (v) Nil. (vi) NP-4 (medium).
 (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 22,23.1.2009. (*Vikrami Samvat*)

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources of N : S₁=A/S and S₂=C/N.

(2) 5 levels of N : N₁=20, N₂=40, N₃=60, N₄=80 and N₅=100 lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 30' × 5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) 1952-54. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :

- (i) 3329 lb./ac.
 (ii) 327.8 lb./ac.
 (iii) None of the effects is significant.
 (iv) Av. yield of grain in lb./ac.

	N ₁	N ₂	N ₃	N ₄	N ₅	Mean
S ₁	3118	3314	3715	3267	3146	3312
S ₂	3360	3256	3202	3379	3528	3345
Mean	3239	3285	3459	3323	3337	3229

S.E. of marginal mean of S = 73.3 lb./ac.
 S.E. of marginal mean of N = 115.9 lb./ac.
 S.E. of body of table = 163.9 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 53 (252).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'M'.

Object :- To study the effect of varying dose of A/S and C/N on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 6.8.2009. (*Vikrami Samvat*)
 (iv) (a) N.A. (b) By *kera*. (c) 32 sr./ac. (d) 9' row to row. (e) —. (v) Nil. (vi) NP-4 (medium).
 (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 10.5.1954.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 sources of N : $S_1=A/S$ and $S_2=C/N$.(2) 5 levels of N : $N_1=20$, $N_2=40$, $N_3=60$, $N_4=80$ and $N_5=100$ lb./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 30'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—54. (b) and (c) No. (v) (a) Nil. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1261 lb./ac.

(ii) 188.8 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	N_1	N_2	N_3	N_4	N_5	Mean
S_1	1167	1120	1475	1195	1297	1251
S_2	1064	1307	1269	1391	1325	1271
Mean	1116	1214	1372	1293	1311	1261

S.E. of marginal mean of S = 42.2 lb./ac.

S.E. of marginal mean of N = 66.7 lb./ac.

S.E. of body of table = 94.4 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 52(168).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'M'.

Object :- To study the effect of time of application of N on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 12/13.8.2009. (*Vikrami Samvat*)
 (iv) (a) N.A. (b) *Kera*. (c) 32 sr./ac. (d) 8'-9' row to row. (e) —. (v) Nil. (vi) NP-4 (medium).
 (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 23.1.2010. (*Vikrami Samvat*).

2. TREATMENTS :

- 40 lb./ac. of N as A/S applied $\frac{1}{2}$ in Autumn and $\frac{1}{2}$ in Spring.
- 40 lb./ac. of N as A/S applied $\frac{2}{3}$ in Autumn and $\frac{1}{3}$ in Spring.
- 40 lb./ac. of N as A/S applied $\frac{1}{3}$ in Autumn and $\frac{2}{3}$ in Spring.
- 40 lb./ac. of N as A/S applied full in Autumn.
- 40 lb./ac. of N as A/S applied full in Spring.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 30'×5'. (b) 30'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) [(a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2116 lb./ac.
 (ii) 218.4 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2128
2.	2134
3.	2103
4.	2159
5.	2054
S.E./mean	= 89.3 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 53(254.)

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'M'.

Object :- To study the effect of time of application of N on yield of Wheat

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 3.8.2010. (*Vikrami Samvat*)
 (iv) (a) N.A. (b) By *Kera*. (c) 32 sr./ac. (d) 8"-9" row to row. (e) —. (v) Nil. (vi) NP-4 (medium).
 (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 13.5.1954.

2. TREATMENTS :

- 40 lb./ac. of N as A/S applied $\frac{1}{2}$ in Autumn and $\frac{1}{2}$ in Spring.
 - 40 lb./ac. of N as A/S applied $\frac{2}{3}$ in Autumn and $\frac{1}{3}$ in Spring.
 - 40 lb./ac. of N as A/S applied $\frac{1}{3}$ in Autumn and $\frac{2}{3}$ in Spring.
 - 40 lb./ac. of N as A/S applied full in Autumn.
 - 40 lb./ac. of N as A/S applied full in Spring.
- Autumn dose applied on 31.12.1953.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 30' x 5'. (b) 30' x 5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) [1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 957 lb./ac.
 (ii) 193.2 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	815
2.	1052
3.	952
4.	1058
5.	909
S.E./mean	= 78.9 lb./ac.

Crop :-Wheat (*Rabi*).

Ref :-J.K. 52(171).

Site :-Central Prov. Agri. Exptl. Farm Talab Tilloo, Jammu. Type :-'M'.

Object :—To study the effect of A/S and C/N with and without F.Y.M. on yield of Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 6.8.2009. (*Vikrami Samvat*)
 (iv) (a) N.A. (b) *Kera*. (c) 32 sr./ac. (d) 8"—9" row to row. (e) —. (v) Nil. (vi) NP-4. (vii) Irrigated.
 (viii) Nil. (ix) N.A. (x) 28/31.1.2010. (*Vikrami Samvat*).

2. TREATMENTS :

1. Control (no manure).
2. 100 lb./ac. of N as F.Y.M.
3. 100 lb./ac. of N as F.Y.M. +20 lb./ac. of N as A/S.
4. 40 lb./ac. of N as A/S.
5. 80 lb./ac. of N as A/S.
6. 40 lb./ac. of N as C/N.
7. 80 lb./ac. of N as C/N.
8. 50 lb./ac. of N as F.Y.M. +20 lb./ac. of N as A/S.
9. 100 lb./ac. of N as F.Y.M. +40 lb./ac. of N as A/S.
10. 50 lb./ac. of N as F.Y.M. +20 lb./ac. of N as C/N.
11. 100 lb./ac. of N as F.Y.M. +40 lb./ac. of N as C/N.

F.Y.M. applied on 6.8.2009, while A/S and C/N on 12.10.2000. (Dates are according to *Vikrami Samvat*.)

3. DESIGN :

- (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) and (b) 30'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

- (i) N.A. (ii) Nil. (iii) Grain-yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil.
 (vi) and (vii) Nil.

5. RESULTS :

- (i) 1181 lb./ac.
 (ii) 322.6 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	1232	7.	1073
2.	1017	8.	1167
3.	1157	9.	1325
4.	1409	10.	1148
5.	1167	11.	1223
6.	1073		
	S.E./mean		=161.3 lb./ac.

Crop :-Wheat (*Rabi*).

Ref :-J.K. 53(253).

Site :-Central Prov. Agri. Exptl. Farm Talab Tilloo, Jammu. Type :-'M'.

Object :—To study the effect of A/S and C/N with and without F.Y.M. on Wheat.

1. BASAL CONDITIONS :

- (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 11.8.2010. (iv) (a) N.A. (b) By
kera. (c) 32 sr./ac. (d) 8"—9" row to row. (e) —. (v) Nil. (vi) NP-4 (medium). (vii) Irrigated. (viii)
 Nil. (ix) N.A. (x) 12,13.5.1954.

2. TREATMENTS:

1. Control (no manure).
 2. 100 lb./ac. of N as F.Y.M.
 3. 200 lb./ac. of N as F.Y.M.
 4. 40 lb./ac. of N as A/S.
 5. 80 lb./ac. of N as A/S.
 6. 40 lb./ac. of N as C/N.
 7. 80 lb./ac. of N as C/N.
 8. 50 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as A/S.
 9. 100 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as A/S.
 10. 50 lb./ac. of N as F.Y.M. + 20 lb./ac. of N as C/N.
 11. 100 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as C/N.
- Time and method of application—N.A.

3. DESIGN :

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) and (b) 30'×5'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Straw and grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1016 lb./ac.
 (ii) 135.5 lb./ac.
 (iii) Treatments are highly significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield	Treatment	Av. yield
1.	812	7.	821
2.	1055	8.	1008
3.	1232	9.	1419
4.	831	10.	989
5.	849	11.	1288
6.	868		
	S.E./mean		=67.8 lb./ac.

Crop :- Wheat (*Rabi*).

Site :- Prov. Agri. Farm, Shalimar.

Ref :- J.K. 53(265).

Type :- 'MV'.

Object :- To study the effect of F.Y.M. and A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 10.11.1953. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) and (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) 9.21⁷. (x) 20.5.1954.

2. TREATMENTS

All combinations of (1) and (2)

(1) 3 varieties : $V_1=NP-4$, $V_2=IP-120$ and $V_3=F$.

(2) 5 manures : $N_0=0$, $N_1=100$ lb./ac. of N as F.Y.M., $N_2=N_1+20$ lb./ac. of N as A/S, $N_3=N_1+40$ lb./ac. of N as A/S and $N_4=N_1+60$ lb./ac. of N as A/S.

F.Y.M. applied before sowing. Date of application of A/S—N.A.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 30'×5'. (b) 30'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil (vii) *Sarson* was also sown mixed with wheat but yield of only wheat is available.

5. RESULTS :

- (i) 856.9 lb./ac.
(ii) 317.44 lb./ac.
(iii) Only M effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean
N ₀	728.1	429.4	532.1	563.2
N ₁	765.4	802.8	746.7	771.6
N ₂	784.1	914.8	914.8	871.2
N ₃	1082.8	1045.4	952.1	1026.8
N ₄	1045.4	1064.1	1045.4	1051.6
Mean	881.2	851.3	838.2	856.9

S.E. of marginal mean of N = 91.64 lb./ac.
S.E. of marginal mean of V = 70.98 lb./ac.
S.E. of body of table = 150.72 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 52(170).

Site :- Central Prov. Agri. Exptl. Farm. Talab Tilloo, Jammu. Type :- 'MV'.

Object :- To study the effect of F.Y.M. alone and along with A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 13.8.2009. (iv) (a) N.A. (b) By hera. (c) 32 sr./ac. (d) 8"-9" row to row. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 27.1.2010.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 3 varieties : V₁=C-591, V₂=NP-745 and V₃=NP-4.(2) 5 applications of N : N₀=0, N₁=100 lb./ac. of N as F.Y.M., N₂=N₁+30 lb./ac. of N as A/S, N₃=N₁+45 lb./ac. of N as A/S and N₄=N₁+60 lb./ac. of N as A/S.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 30'×5'. (b) 30'×5' (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1318 lb./ac.
(ii) 275.7 lb./ac.
(iii) N effect is significant, V effect is highly significant, while interaction N×V is not significant.
(iv) Av. yield of grain in lb./ac.

	V ₁	V ₂	V ₃	Mean
N ₀	1232	952	1139	1108
N ₁	1624	1185	1391	1400
N ₂	1671	1073	1176	1307
N ₃	1643	1017	1307	1322
N ₄	1662	1176	1521	1453
Mean	1566	1081	1307	1318

S.E. of marginal mean of V = 61.6 lb./ac.
S.E. of marginal mean of N = 79.6 lb./ac.
S.E. of body of table = 137.8 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 53(255).

Site :- Central Prov. Agri. Exptl. Farm Talab Tilloo, Jammu. Type :- 'MV'.

Object :- To study the effect of F.Y.M. alone and along with A/S on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 14.8.2010. Vikrami Samvat. (iv) (a) N.A. (b) By *Kera*. (c) 32 sr./ac. (d) 8-9" row to row (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 1 and 4.2.2011.

2. TREATMENTS

All combinations of (1) and (2).

(1) 3 varieties : $V_1=C-591$, $V_2=NP-745$ and $V_3=NP-4$.(2) 5 applications of N : $N_0=0$, $N_1=100$ lb./ac. of N as F.Y.M., $N_2=N_1+30$ lb./ac. of N as A/S, $N_3=N_1+45$ lb./ac. of N as A/S, $N_4=N_1+60$ lb./ac. of N as A/S.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 20'×5'. (b) 20'×5' (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1952—1954. (b) No. (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 1804 lb./ac.
(ii) 402.1 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

	V_1	V_2	V_3	Mean
N_0	1120	1190	1400	1237
N_1	1652	1680	1652	1661
N_2	2156	1806	1918	1960
N_3	2002	1778	2086	1955
N_4	2338	2394	1890	2207
Mean	1854	1770	1789	1804

S.E. of marginal mean of V = 89.9 lb./ac.
S.E. of the marginal mean of N = 116.1 lb./ac.
S.E. of body of table = 201.1 lb./ac.

Crop :- Wheat (*Rabi*)

Ref :- J.K. 52(176).

Site :- Agri. Farm, Rajhani.

Type :- 'C'.

Object :- To study the effect of different seed rates on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18.11.1952. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 19.4.1953.

2. TREATMENTS

3 seed rates : $R_1=48$, $R_2=56$, and $R_3=64$ lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 86'×12.25'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 569.9 lb./ac.
 (ii) 89.34 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
R ₁	506.5
R ₂	586.7
R ₃	586.7
S.E./mean	= 44.67 lb./ac.

Crop :- Wheat (*Rabi*).

Site :- Prov. Agri. Farm, Shalimar.

Ref :- J.K. 52 (186).

Type :- 'C'.

Object :- To study the best seed rate for Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clayey loam. (b) N.A. (iii) 9.11.1952. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) Nil. (vi) Wheat Ford (late type). (vii) Irrigated. (viii) N.A. (ix) 7.09". (x) 22.5.1953.

2. TREATMENTS :

3 seed rates : R₁=48, R₂=64 and R₃=80 lb./ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 5'×40'. (b) 5'×40'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 2154 lb./ac.
 (ii) 812.3 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	2641
2.	1853
3.	1967
S.E./mean	= 406.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 51 (138).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'C'.

Object :- To study the effect of seed rate on yield of Wheat.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 24.7.2008. (iv) (a) N.A. (b) Broadcast. (c) As per treatments. (d) and (e) —. (v) N.A. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 22.1.2009.

2. TREATMENTS :

1. Normal seed rate at 28 seer/ac.
2. Sub-normal seed rate at 24 seer/ac.
3. Above normal seed rate at 32 seer/ac.

3. DESIGN :

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 60' x 17.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Dates according to *Vikrami Samvat*.

5. RESULTS :

- (i) 1606 lb./ac.
- (ii) 92.4 lb./ac.
- (iii) Treatments are not significantly different.
- (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	1612
2.	1513
3.	1693
S.E./mean	= 46.2 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 51 (139).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'C'

Object :- To study the optimum date of sowing for Wheat.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Loamy type. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Sown by *kera*. (c) 30 sr./ac. (d) 8" row to row. (e) —. (v) Nil. (vi) C.591 (medium). (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 27.1.2009.

2. TREATMENTS :

5 dates of sowing : $D_1=22.7.2008$, $D_2=2.8.2008$, $D_3=12.8.2008$, $D_4=22.8.2008$ and $D_5=2.9.2008$.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 60' x 17.75'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield/plot. (iv) (a) Not continued. (b) No. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) Dates according to *Vikrami Samvat*.

5. RESULTS :

- (i) 861 lb./ac.
- (ii) 224.9 lb/ac.
- (iii) Treatments are not significantly different.

(iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D ₁	1300
D ₂	1132
D ₃	859
D ₄	629
D ₅	387
S.E./mean	= 100.3 lb./ac

Crop :- Wheat (*Rabi*).
 Site :- Agri. Farm, Gramwala.

Ref :- J.K. 52(175).
 Type :- 'CV'.

Object :- To study the optimum seed rate for different Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 12.8.2009. (iv) (a) N.A. (b) *Kera*. (c) N.A. (d) Row to row 9°. (e) —. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (x) N.A. (x) 26.1.2010.

2. TREATMENTS :

A combinations of (1) and (2)

(1) 2 varieties : V₁=NP-4 and V₂=C-591.

(2) 6 seed rates : R₁=24, R₂=28, R₃=32, R₄=36, R₅=40 and R₆=44 sr./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 44'×5'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) and (c) No. (v) (a) No. (b) Nil. (vi) Nil. (vii) Dates according to *Vikrami Samvat*.

5. RESULTS :

(i) 634.3 lb./ac.

(ii) 171.1 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	Mean
V ₁	617.3	655.5	655.5	751.0	642.8	636.4	659.7
V ₂	426.4	674.6	579.2	712.8	617.3	642.8	608.9
Mean	521.9	665.1	617.4	731.9	630.1	639.6	634.3

S.E. of marginal mean of V = 34.93 lb./ac.

S.E. of marginal mean of R = 60.50 lb./ac.

S.E. of body of table = 85.53 lb./ac.

Crop :- Wheat (*Rabi*).

Ref :- J.K. 52(169).

Site :- Central Prov. Agri. Exptl. Farm, Talab Tilloo, Jammu. Type :- 'CV'.

Object :- To study the optimum seed rate for different Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 11/12.8.2009. *Vikrami Samvat*
 (iv) (a) N.A. (b) By *kerā*. (c) As per treatments. (d) 8"-9" row to row. (e) —. (v) Nil. (vi) As per
 treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 24.2.2010.

2. TREATMENTS :

All combinations of (1) and (2)

(1) 2 varieties : $V_1=NP-4$ and $V_2=C-591$.(2) 6 seedrates : $R_1=24$, $R_2=28$, $R_3=32$, $R_4=36$, $R_5=40$ and $R_6=44$ sr./ac.

3. DESIGN :

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30'×5'. (b) 30'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair to normal. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil.
 (v) (a) Agri. Farm, Gramwala. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1561 lb./ac.

(ii) 248.2 lb./ac.

(iii) V effect is highly significant, interaction $R \times V$ is significant, while R effect is not significant.

(iv) Av. yield of grain in lb./ac.

	R_1	R_2	R_3	R_4	R_5	R_6	Mean
V_1	1344	1325	1279	1241	1437	1120	1291
V_2	1746	1867	1970	2016	1568	1820	1831
Mean	1545	1596	1625	1629	1503	1470	1561

S.E. of marginal mean of V

= 50.7 lb./ac.

S.E. of marginal mean of R

= 87.8 lb./ac.

S.E. of body of table

= 124.1 lb./ac.

Crop :- Wheat (*Rabi*),

Ref :- J.K. 53(256).

Site :- Central Prov. Agri Exptl. Farm, Talab Tilloo, Jammu. Type :- 'CV'.

Object :- To study the optimum seed rate for Wheat varieties.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Loamy type. (b) N.A. (iii) 14.8.2010. (iv) (a) N.A. (b) By
kerā. (c) As per treatments. (d) 8"-9" row to row. (e) —. (v) Nil. (vi) As per treatments. (vii)
 Irrigated. (viii) Nil. (ix) N.A. (x) 2/3.2.2011.

2. TREATMENTS :

All combinations of (1) and (2).

(1) 2 varieties : $V_1=NP-4$ and $V_2=C-591$.(2) 6 seedrates : $R_1=24$, $R_2=28$, $R_3=32$, $R_4=36$, $R_5=40$ and $R_6=44$ sr./ac.

3. DESIGN

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 28'×5'. (b) 28'×5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952-1954. (b) No. (c) No. (v) (a) No. (b) Nil. (vi) and (vii) Dates according to *Vikrami Samvat*.

5. RESULTS :

- (i) 1612 lb./ac.
 (ii) 226.5 lb./ac.
 (iii) V effect is highly significant, R effect is significant, while interaction is not significant.
 (iv) Av. yield of grain in lb./ac.

	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	Mean
V ₁	1633	1799	1940	2100	2052	1813	1890
V ₂	1167	1332	1381	1400	1439	1283	1334
Mean	1400	1566	1661	1750	1746	1548	1612

S.E. of the marginal mean of V = 46.2 lb./ac.
 S.E. of the marginal mean of R = 80.1 lb./ac.
 S.E. of body of table = 113.3 lb./ac.

Crop :- Maize (*Khariif*).

Ref :- J.K. 52(172).

Site :- Agri. Farm, Gramwala.

Type :- 'M'.

Object :- To study effect of F.Y.M. alone and in combination with A/S.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 10.7.1952. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) —. (e) —. (v) Nil. (vi) Maize cross No. 1 (medium). (vii) Unirrigated. (viii) 1 hoeing. (ix) N.A. (x) 27.9.1952.

2. TREATMENTS :

- Control (no manure).
- 100 lb./ac. of N as F.Y.M.
- 100 lb./ac. of N as F.Y.M.+15 lb./ac. of N as A/S.
- 100 lb./ac. of N as F.Y.M.+30 lb./ac. of N as A/S.
- 100 lb./ac. of N as F.Y.M.+45 lb./ac. of N as A/S.

3. DESIGN :

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 33'×16.5'. (b) 33'×16.5'. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

- (i) 812 lb./ac.
 (ii) 292.5 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
1.	453
2.	660
3.	1007
4.	913
5.	1027
S.E./mean	=168.9 lb./ac.

Crop :- Maize (*Kharif*).
 Site :- Agri. Farm, Gramwala.

Ref :- J.K. 52(173).
 Type :- 'C'.

Object :- To find the optimum date of sowing for Maize crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) As per treatments. (iv) (a) N.A. (b) Broadcast. (c) N.A. (d) —. (e) —. (v) Nil. (vi) Maize cross No. 1 (medium). (vii) Unirrigated. (viii) One hoeing. (ix) N.A. (x) N.A.

2. TREATMENTS :

4 sowing dates : $D_1=23.3.2009$, $D_2=30.3.2009$, $D_3=5.4.2009$ and $D_4=12.4.2009$.

3. DESIGN :

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 33' x 2'. (v) N.A. (vi) Yes.

4. GENERAL :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) Not continued. (b) No. (c) —. (v) (a) No. (b) Nil. (vi) Nil. (vii) Originally planned with 5 dates of sowing but conducted with 4 dates of sowing. Dates are according to *Vikrami Samvat*.

5. RESULTS :

- (i) 258.9 lb./ac.
 (ii) 15.00 lb./ac.
 (iii) Treatments are not significantly different.
 (iv) Av. yield of grain in lb./ac.

Treatment	Av. yield
D_1	678.9
D_2	233.4
D_3	84.9
D_4	38.2
S.E./mean	=10.61 lb./ac.

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